



Draft Plan Amendment & Draft Environmental Impact Statement/ Draft Environmental Impact Report for the Alta East Wind Project

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***Alta East Wind Project
by Alta Windpower Development, LLC
(PP11212)***

***Volume 5
Appendices E through Q***

General Plan Amendment 2, Map 168;
General Plan Amendment 3, Map 179;
General Plan Amendment 1, Map 180;
Zone Change Case 10, Map 168;
Zone Change Case 4, Map 168-27;
Conditional Use Permit No. 7, Map 168



**Kern County
Planning and Community Development Department
Bakersfield, California**



**United States Department of the Interior
Bureau of Land Management; California Desert District Office
Moreno Valley, California**

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Alta East Wind Project Supplemental Visual Resources Management (VRM) Analysis

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1.0 Executive Summary

The Alta East Wind Project (the project) would be located on lands under the jurisdiction of Kern County and the U.S. Bureau of Land Management (BLM). Public lands administered by the BLM on which the project is proposed are currently unclassified with regard to visual resources. This analysis supplements the report previously prepared (Alta East Wind Project Visual Resources Report, dated September 20, 2010) by describing the results of a Visual Resources Inventory (VRI), establishing an Interim Visual Resources Management (VRM) Classification and preparing a contrast rating analysis in accordance with BLM VRM methodology.

The project would be located within the Tehachapi Wind Resource Area, an established wind development area. Existing wind turbines are predominant in views toward the mountains throughout the area west of Mojave.

A VRI was performed by a multidisciplinary team during a two-day site visit to the project site. The project site was delineated into three Scenic Quality Rating Units (SQRUs): Tehachapi Pass, Tehachapi Foothills, and Desert Floor (SQRU 001 through 003, respectively). After assessing the scenic quality, sensitivity level, and distance zones of each SQRU, an interim VRM classification was assigned using both overlay mapping and the BLM tabular matrix described in BLM VRI Manual 8410. SQRU 001 was assigned to be Class III and SQRUs 002 and 003 Class IV. Subsequently, contrast rating analyses were performed for each of the seven Key Observation Points (KOPs) previously identified for the project. The overall degree of contrast for each of the seven KOPs was found to be consistent with VRM objectives associated with the interim VRM classifications.

2.0 Introduction/Overview

Visual, or aesthetic, resources are the natural and cultural features of the landscape that can be seen and that contribute to the public's appreciative enjoyment of the environment. Visual resources impacts are generally defined in terms of a project's physical characteristics and potential visibility and the extent to which the project's presence would change the perceived visual character and quality of the environment in which it would be located.

This analysis evaluates the existing visual conditions in the area surrounding the site of the proposed Alta East Wind Project and assesses the extent to which the project introduces contrast with the existing scenic quality. In this analysis, “project” refers to the wind farm portion of the project site, which includes the land on which the turbines are proposed to be constructed. The project’s transmission facilities, as currently proposed, are not located within public lands administered by the BLM.

A visual resources report satisfying California Environmental Quality Act (CEQA) requirements was previously prepared for the project. This report supplements the previously prepared technical report in order to satisfy BLM requirements, relying on views from the same KOPs previously analyzed.

All figures referenced below are located in Appendix A.

3.0 Methodology

3.1 Visual Resources Inventory

The proposed project area does not have an established BLM VRM Classification. BLM VRM Classifications (Class I, II, III, or IV) are used to establish visual “values” for BLM-administered public lands and establish visual resource baseline conditions. Where there is lack of established BLM VRM Classification, Interim BLM VRM Classification is required. The visual resource assessment to produce this interim classification followed methods described in the BLM’s VRM program, and included the following components:

- Implementation of VRI, including designation of Scenic Quality Rating Units (SQRU), each with several inventory locations.
- Identification of Sensitivity Level Rating Units (SLRU) and implementation of Sensitivity Level Analysis.
- Classification of Distance Zones.
- Completion of interim Scenic Quality Level Classification.

Interim VRM Classifications can then be determined in a spatial context by combining overlays for scenic quality, sensitivity levels, and Distance Zones, or by using a tabular matrix (as detailed in Section 3.2). Both were used in this analysis.

3.1.1 Scenic Quality

Scenic quality is defined as “a measure of the visual appeal of a tract of land” (BLM, 1986). The highest scenic quality ratings are assigned to landscapes that have the most variety and most harmonious composition in relation to the natural landscape. Scenic quality can be used to describe the existing conditions, the standard for management, or the desired future conditions. As discussed above, this analysis is intended to provide an interim VRM classification for the project area.

The scenic quality assessment followed BLM VRM methodology and included the delineation of SQRUs and the scenic quality rating of these units. SQRUs and inventory locations were identified by the CH2M Hill Interdisciplinary Team (IDT). Rating units were delineated based on physiographic characteristics, similar or unique visual patterns, development, user types and amounts, and variety of features. Photographs taken by the IDT document the scenery in each SQRU. The visual quality of landforms/water,

vegetation, and structure at each SQRU was then assessed in terms of texture, color, form, and line, and each SQRU was ranked using the following seven factors:

- Landform
- Vegetation
- Water
- Color
- Adjacent scenery
- Scarcity
- Cultural modification

Factors were ranked by evaluating the scenic quality and rarity of each feature within the physiographic region and were quantitatively scored and recorded on BLM Form 8400-1. A final score was then calculated for each SQRU using BLM Form 8400-5, and numeric values were assigned to each of the seven factors listed above. Scenic Quality Ratings are intended to provide a standardized method of developing the intrinsic quality of existing visual resources. Based on these results, each SQRU was assigned a scenic quality rating of A, B, or C, as defined by BLM VRM Manual H-8410-1 below.

- Class A: Areas have outstanding diversity or interest; characteristic features of landform, water, and vegetation are distinctive or unique in relation to the surrounding region. These areas contain considerable variety in form, line, color, and texture.
- Class B: Areas have above-average diversity or interest, providing some variety in form, line, color, and texture. The natural features are not considered rare in the surrounding region but provide adequate visual diversity to be considered valuable.
- Class C: Areas have minimal diversity or interest; representative natural features have limited variation in form, line, color, or texture in the context of the surrounding region. Discordant cultural modifications (*e.g.*, substations, transmission lines, and other cultural modifications) can be highly noticeable, which can reduce the inherent value of the natural setting.

3.1.2 Sensitivity Levels

Sensitivity Level is a measure of public sensitivity toward the scenic value of an area. Sensitivity Level within the project area was determined following methods described in BLM Manual H-8410-11¹ and presented in Appendix E. Following this methodology, SLRUs were assigned to the project area. Sensitivity levels are intended to provide a standardized method to evaluate the public's concern towards the scenic value of an area. Within each SLRU, the following factors were evaluated and given a ranking ranging from high to low:

- Type of User: Visual sensitivity will vary with the type of users. Recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change.

¹ USDI Bureau of Land Management, 1986. Visual Resource Inventory - BLM Manual 8410-1. 17 January. Section 2 – Scenic Quality Evaluation.

- Amount of Use: Areas seen by and used by large numbers of people are potentially more sensitive. Protection of visual values usually becomes more important as the number of viewers increases.
- Public Interest: The visual quality of an area may be of concern to local, state, or national groups. Indicators of this concern are usually expressed in public meetings, letters, newspaper, or magazine articles, newsletters, land-use plans, etc. Public controversy created in response to proposed activities that would change the landscape character should also be considered.
- Adjacent Land Use: The interrelationship with land uses in adjacent lands can affect the visual sensitivity of an area. For example, an area within the viewshed of a residential area may be very sensitive whereas an area surrounded by commercially developed lands may not be visually sensitive.
- Special Management Areas: Management objectives for special areas such as Natural Areas, Wilderness Areas or Wilderness Study Areas, Wild and Scenic Rivers, Scenic Roads or Trails, and ACECs, frequently require special consideration for the protection of visual values. This does not necessarily mean that these areas are scenic, but rather that one of the management objectives may be to preserve the natural landscape setting. The management objectives for these areas may be used as a basis for assigning sensitivity levels.

To evaluate each SLRU as a whole, the rankings of the factors presented above were considered together to create a sensitivity level of high, medium, low or a combination thereof. The results of this exercise are presented below.

3.1.3 Distance Zones

Distance Zones are established based on the extent of the viewshed seen from travel routes or observation points. Distance Zones include: foreground/middleground, background, and seldom seen areas. The foreground/middleground zone includes areas that can be seen within a distance of 3 to 5 miles. The background zone includes areas beyond the foreground/middleground zone, at distance of less than 15 miles.

Distance Zones for the project area were determined by evaluating viewsheds from nearby travel routes and vistas, including but not limited to:

- State Route 58 (SR 58)
- Pacific Crest Trail (PCT)
- Unincorporated community of Mojave

A viewshed analysis conducted as part of the technical report previously prepared for the project (and described in greater detail in Section 3.4) indicated the potential visibility of the proposed project from within and beyond the project area.

3.2 Interim VRM Classification

The purpose of establishing Visual Resource Inventory Classes for the planning area is three fold: (1) to provide an inventory tool that describes the relative value of the visual resources,

(2) to develop a management tool that portrays the visual management objectives, and (3) to create a baseline with which to analyze potential visual impacts from the project. The inventory is a summation of the comprehensive inventories of Scenic Quality, Public Sensitivity and Distance Zones in relation to landscape characteristics. Based on the results of this analysis, visual resources are classified as Class I – IV, depending on the overall significance of the resource, juxtaposition in the landscape, and the sensitivity of key users. They do not establish management direction, and should not be used as a basis for constraining or limiting surface disturbing activities. Classes are defined as follows:

- Class I: The objective of this class is to preserve the existing character of the landscape. Changes to the landscape character should not be evident.
- Class II: The objective of this class is to retain the existing character of the landscape. Changes to the landscape character may attract slight attention but should be subordinate to the visual setting.
- Class III: The objective of this class is to partially retain the existing character of the landscape. Changes to the landscape character may begin to attract attention but should not dominate the visual setting.
- Class IV: The objective of this class is to allow for activities that modify the existing character of the landscape. Changes to the landscape character may attract attention and dominate the visual setting. However, these activities should minimize changes to the landscape where possible.

Visual resource inventory classes can be determined in a spatial context by combining overlays for scenic quality, sensitivity levels, and Distance Zones, or by using a tabular matrix. Both were used in this analysis.

3.3 Contrast Rating Analysis

The visual resource contrast rating is a systematic process used to analyze the potential visual impact of proposed projects and activities. The degree to which an activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The contrast can be measured by comparing the project features with the major features in the landscape. Form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project. This assessment process provides a means for determining visual impacts and for identifying measures to mitigate these impacts. The complete process is described in BLM Handbook H-8431-1, Visual Resource Contrast Rating.

Contrast ratings were performed for each of the seven KOPs described in detail in Section 6. The existing landscape was first characterized by describing land/water, vegetation, and structures in terms of the basic elements of form, line, color, and texture in the Interim VRM Classification presented in Section 5 of this report. Second, post-construction changes to land/water, vegetation, and structures resulting from project actions were described, again in terms of form, line, color, and texture. These contrast ratings were performed using KOPs and simulations from the previously prepared technical report (see Appendix D). For the purposes of this report, Table 5 will serve as the tabular analysis of the overall contrast

(between land/water, vegetation, and structures) identified on BLM Form 8400-4 for the characteristic landscape description. The completed forms are presented in Appendix E.

Once the contrast rating was completed, it was determined whether or not the proposed project development would meet the established VRM objectives for each KOP. Should the project not meet objectives, an impact to visual resources would be identified.

3.4 Study Procedure

The study process began with a review of maps on which the project features had been plotted, and the determination of the project's viewshed.² A viewshed analysis (often referred to as a zone of visual influence or ZVI analysis in the context of wind power visual impact assessment) is most commonly a computer-generated graphic that relies upon the maximum elevations of the project features and surrounding topography to identify locations from which the project would theoretically be visible via an unobstructed or partial line-of-sight. An initial viewshed radius of 20 miles was assumed. Results of this analysis indicated the areas from which the turbines associated with the project have the potential to be visible. Taking into account typical atmospheric conditions in the area, as well as the locations of viewers and travel routes, attention was focused on the portions of the viewshed within 10 miles of the Alta East Wind project site. Based on review of the results of the viewshed/ZVI analysis, areas were identified where turbines would have the potential to be visible from visually sensitive areas. These areas were visited, and existing visual conditions were documented. A representative subset of these was selected as KOPs to serve as the basis for the analysis of the project's potential effects on the project area's visual resources.

For the view from each of the KOPs, a photograph was selected to provide the basis for development of a simulation to depict the view as it would appear with the completed project in place. The photographs used as the basis for the simulations were all taken with a digital camera set to take photos equivalent to those taken with a 35-mm camera using a 50-mm focal length. Single-frame images were used. For each view, computer modeling and rendering techniques were used to produce the simulated images. Existing topographic and site data provided the basis for developing an initial digital model. Project engineers provided site plans and digital data for the proposed facilities. These were used to create three-dimensional (3-D) digital models of the turbines, substation and other structures. These models were then combined with the digital site model to produce a complete computer model of the Alta East Wind project.

For each simulation viewpoint, a viewer location was digitized from topographic maps and scaled aerial photographs, using five feet as the assumed viewer eye level. Computer "wire frame" perspective plots were then overlaid on the photographs of the views from the simulation viewpoints to verify scale and viewpoint location. Digital visual simulation images were produced as a next step based on computer renderings of the 3-D model combined with high-resolution digital versions of base photographs. The final "hardcopy" visual simulation images that appear in this document were produced from the digital image files using a color printer.

² The location of all project features used in this analysis are approximate and based on current proposed site layout. Exact locations may change pending final siting and engineering design.

To supplement visual resources analysis and surveys performed to date, an Interdisciplinary Team (IDT) from CH2M Hill performed a two-day site visit on June 27th and 28th, 2011, to collect data and establish the VRI components. Photographs taken throughout the project site were utilized to support the VRI, Interim VRM Classification, and contrast rating analysis. In addition, panoramic images showing the wider landscape context surrounding views from some of the simulation viewpoints were created.

Comparison of the “before” photographs with the simulations of the project as it would appear after construction provided the basis for determining the degree of contrast between existing views and post-project development was performed using the simulations described above. The contrast rating was evaluated against the contrast rating designated to be consistent with the determined interim VRM classification. This evaluation is discussed below in Section 6.0.

4.0 Visual Resources Inventory

The project site is located Kern County, in the western portion of the Mojave Desert and within the foothill region of the Tehachapi Mountains known as the Horned Toad Hills. The site is approximately 3 miles northwest of the town of Mojave and 11 miles east of the town of Tehachapi. This area is known as the Tehachapi Wind Resource Area and has some of the best wind resources in California. Several wind farms already exist in this area and many more are currently undergoing the regulatory review process.

The area within which the project is proposed is characterized visually by steep to moderate slopes that extend from the mountain foothills to the western edge of the desert floor, near the town of Mojave. The project is located in a region heavily developed with existing wind energy facilities and with several more projects pending. The northern and eastern portions of the project site have, in the past, been developed for wind energy generation. The turbines associated with these former projects have since been removed, though their foundations remain. These foundations would be removed during construction of the project, including from the portion of the project site north of SR 58.

The 800 MW Alta Oak Creek Mojave (AOCM) Project located approximately 3 miles southwest of the project site is currently operating, as is the 120 MW Windstar Project, which includes lands approximately 3 miles south and six miles west of the project site. Other existing wind projects located in the Tehachapi area include Cal Wind, Cameron Ridge, and FPL Energy. The Rising Tree Wind Farm, proposed by Horizon Wind Energy, would be adjacent to the south of the project site. The Alta Infill II Wind Energy Project is located less than one mile south and east of the project site. Further away, the completed Los Angeles Department of Water and Power (LADWP) Pine Tree Wind Project and the proposed NextEra Wind project site are located about 15 miles and 20 miles north, respectively, from the project site. The PdV Wind Energy Project is located about 18 miles southwest of the site. Additionally, construction is now underway on Segment 10 of the Tehachapi Renewable Transmission project, which terminates at the Windhub Substation located approximately 3.2 miles southwest of the project site. Existing wind turbines are predominant in views toward the mountains west of Mojave. Scrub brush is the predominant vegetation in the area.

4.1 Scenic Quality

4.1.1 Delineation of SQRUs

To frame the analysis of visual effects from the project, the project site is divided into appropriate SQRUs that are spatially enclosed and/or visually bounded and have distinct landscape character and interrelated visual elements. In order to appreciate the areas surrounding the project site, a half mile buffer was used to delineate the SQRUs.

As shown on Figure A-1 (located in Appendix A), the project site was delineated into three distinct SQRUs as follows:

- SQRU 001: Tehachapi Pass
- SQRU 002: Tehachapi Foothills
- SQRU 003: Desert Floor

Each SQRU was evaluated using BLM VRI methodology, as described below. Additionally, the IDT completed a Scenic Quality Field Inventory Form (Form 8400-1) and Scenic Quality Rating Summary (Form 8400-5), presented in Appendix B. Representative photographs of each SQRU, taken from locations within or adjacent to the SQRU, are presented in Appendix C. Existing views from each of the KOPs (see Figure A-2 for KOP locations), including panoramic images for views in which the proposed project appear in the foreground and/or middleground (within 4 miles of the KOP), are included in Appendix D.

A summary description of each SQRU is provided below. Table 1 provides the summary scenic quality ratings. The letters at the tops of the columns indicate the variables that were taken into account in evaluating scenic quality. These variables were landform (L), vegetation (V), water (W), color (C), adjacent scenery (AS), scarcity (S), and cultural modifications (CM). For each Scenic Quality Rating Unit, there are two rows of data, representing the rating scores assigned by the evaluators (E) whose initials are indicated in the first column. For each SQRU, the scores given by the two members of the IDT were averaged and then totaled to assign an overall scenic quality rating (SQR) per unit.

TABLE 1

SCENIC QUALITY EVALUATION BY SQRU

E	L	V	W	C	AS	S	CM	Total	SQR
SQRU 001									
JH	3	2	0	3	3	3	-3	11	C
CLB	4	3	0	3	3	2	-2	13	B
Overall	3.5	2.5	0	3	3	2.5	-2.5	12	B
SQRU 002									
JH	2	2	0	2	1	1	-2	6	C
CLB	2	2	0	2	2	2	-2	8	C
Overall	2	2	0	2	1.5	1.5	-2	7	C

TABLE 1

SCENIC QUALITY EVALUATION BY SQRU

E	L	V	W	C	AS	S	CM	Total	SQR
SQRU 003									
JH	1	2	0	1	2	1	-1	6	C
CLB	1	3	0	3	2	2	-2	9	C
Overall	1	2.5	0	2	2	1.5	-1.5	7.5	C

4.1.2 SQRU 001 Description

SQRU 001 is characterized visually by relatively steep east- to south-facing slopes through which the PCT winds, trending generally northeast – southwest. This segment of the PCT is approximately 1,000 feet higher in elevation than the desert valley floor to the east. When unimpeded by vegetation or terrain, views to the east are expansive and can include much of the desert valley floor, beyond the lower extent of the eastern Tehachapi Pass. A cluster of residences and other structures including the railroad, SR 58 itself, and a California Highway Patrol weigh station are contained within the SQRU. Existing turbines located atop the ridgeline south of SR 58 are prominently visible from locations along the PCT (see Figure D-1c in Appendix D).

Form is dominated by mountain ridgelines, geometric shapes of Joshua trees and other larger scrub bushes, and the linear form of SR 58. Lines include the roughly horizontal shape of the ridgeline against the sky, periodic vertical Joshua trees, and horizontal railroad and SR 58. There are no noticeable water features within SQRU 001. Landform and vegetation colors are predominantly greens, browns, tans and grays, with pockets of purple, yellow, and white wildflowers when in bloom. Structures generally blend in with the natural colors of the landscape, though SR 58 and existing turbines along the ridgeline to the south of the highway can be dominant elements of the view, depending on viewer proximity (see representative images in Figures C-1 and C-2). The drainages cut into the mountains and the spotted vegetation create a diverse texture within the SQRU. Adjacent scenery to the north includes portions of ridgelines that do not have the wind energy development that is characteristic of most of the area north of the project site (see representative image in Figure C-1). As indicated in Table 1 above, the scenic quality rating for SQRU 001 was determined to be Class B.

4.1.3 SQRU 002 Description

SQRU 002 is characterized by rolling foothills located against the base of taller mountains within SQRU 001 (see representative images in Figures C-3 and C-4). Other than wind turbines located in the southwestern portion of the SQRU, cultural modifications are largely limited to dirt roads and scattered structures. Views from SQRU 002 are expansive to the south and west, where commercial, residential and industrial development is evident.

SQRU 002 landform is dominated by the rolling foothills and sparse vegetation. The vegetation in SQRU 002 is significantly sparser and contains fewer Joshua Trees (the more visual interesting species) than the other SQRUs. There are no water features within the

SQRU. Colors are primarily earth colors and because vegetation is limited, there is little contrast between the browns and tans of the vegetation and the colors of the landforms. Adjacent scenery includes mountains to the north, and expansive views toward the flat desert floor, containing many cultural modifications. As indicated in Table 1 above, the scenic quality rating for SQRU 002 was determined to be Class C.

4.1.4 SQRU 003 Description

SQRU 003 is characterized by the prominence of both natural resources, with desert vegetation appearing in foreground and middleground and with the Tehachapi Mountains as a backdrop, and cultural modifications, with industrial, commercial, and residential development clearly visible from this area. Wind turbines appear across nearly the entire north-facing backdrop of the view (see representative images in Figures C-5 and C-6). The existing visual character in this view reflects the presence of wind energy development in this region in addition to the diversity of cultural modifications.

SQRU 003 form is dominated by flat desert floor against which relatively dense Joshua Trees are easily visible. Vegetation is diverse, including the aforementioned Joshua Trees, large creosote bushes, and other desert scrubs. There are no water features within SQRU 003. Colors are predominantly earth tones: browns, tans, and greens; however, there are pockets of flowers contributing sporadic patches of white, yellow, and purple when these flowers are in bloom. Structures within the SQRU include graded roads, transmission lines, the California Aqueduct, and a railroad storage structure in addition to sparse rural residential structures. The diversity and relative density of the desert vegetation adds to the texture of the SQRU and increases the visual quality. As indicated in Table 1 above, the scenic quality rating for SQRU 003 was determined to be Class C.

4.2 Viewer Sensitivity Levels

4.2.1 Delineation of Sensitivity Level Rating Units

Evaluation of sensitivity levels in the vicinity of the project concluded that users, level of uses, and viewer expectations are generally consistent with the scenic quality of the area. Therefore, for the purposes of this analysis, Sensitivity Level Rating Units are equivalent to the SQRUs delineated above. Each SQRU was evaluated for viewer sensitivity levels using BLM VRI methodology, as described below. Additionally, the IDT completed a Sensitivity Level Rating Sheet (BLM Form 8400-6), presented in Appendix B.

A summary description of the sensitivity level of each SQRU is provided below and a table provides the summary sensitivity level ratings. The letters at the tops of the columns indicate the variables that were taken into account in evaluating scenic quality. These variables were type of user (TU), amount of use (AU), public interest (PI), adjacent land use (ALU), special areas (SA), and other factors (OF). For each SQRU, there are two rows of data, representing the rating scores assigned by the evaluators (E) whose initials are indicated in the first column. These individual scores, taken in aggregate, produced each evaluator's sensitivity level rating (SLR), which were then considered in the assignment of an overall SLR for the SQRU.

TABLE 2

SENSITIVITY LEVEL EVALUATION BY SQRU

E	TU	AU	PI	ALU	SA	OF	SLR
SQRU 001							
JH	M/L	M/L	M	L	H	-	M/L
CLB	H/M	M	M	M	H	M	M
Overall	M	M	M	M/L	H	M	M
SQRU 002							
JH	L	L	L	L	L	-	L
CLB	L	L	L	L	L	L	L
Overall	L	L	L	L	L	L	L
SQRU 003							
JH	L	L	M/L	L	L	-	L
CLB	M	M	L	L	L	M	M/L
Overall	M/L	M/L	L	L	L	M	M/L

4.2.2 SQRU 001 Sensitivity Levels

Predominant users of SQRU 001 include the inhabitants of scattered rural residences, travelers along SR 58, and recreationists traveling along the PCT. The PCT is a National Scenic Trail, and the SLR rating in Table 2 reflects its assumed status as a special area. Specifically, the management objectives related to views from the PCT were taken into account after consultation with BLM. Consideration of viewer sensitivity from this segment of the trail also included the wider context of existing wind energy structures and infrastructure in this particular region. Hikers in this area have a reasonable expectation of views containing structures, including wind turbines and associated wind energy structures (see Figure D-1c).

With regard to views from locations other than the PCT, the project is relatively close to residences and SR 58. Additionally, unlike the SR 58 corridor and the ridge top immediately south of the highway, the northern portion of the SQRU remains largely undeveloped and is devoid of wind turbines. Therefore, an increased sensitivity toward development within this area is assumed, and the overall sensitivity level rating for SQRU 001 was judged to be Moderate.

4.2.3 SQRU 002 Sensitivity Levels

SQRU 002 is the least accessible SQRU, with a low level of apparent use. It includes no formal recreation facilities, though this area is visible from parks on the west side of Mojave (outside of the SQRU). Additionally, because the SQRU contains existing wind turbine development, public interest in the visual quality of this area is expected to be lower than other SQRUs. Therefore, the sensitivity level rating for SQRU 002 was judged to be Low.

4.2.4 SQRU 003 Sensitivity Levels

SQRU 003 contains the area with the greatest population, and while residents are generally assumed to have relatively higher sensitivity with regard to nearby aesthetics, the SQRU also contains the most highly modified landscape. Because SQRU 003 is more developed, it is more easily accessible by the public. No formal recreational opportunities were observed within the SQRU, though this area is visible from parks on the west side of Mojave (outside of the SQRU). Therefore, the sensitivity level rating for SQRU 003 was judged to be Moderate/Low.

4.3 Distance Zones

Distance Zones for the project area were determined by evaluating viewsheds from nearby travel routes and vistas, including but not limited to:

- State Route 58 (SR 58)
- Pacific Crest Trail (PCT)
- Unincorporated community of Mojave

Because of each SQRU's proximity to each of these areas (3-5miles), all SQRUs were evaluated to be within the Foreground/Middleground (F/M) distance zone.

5.0 Interim VRM Classification

As discussed above, visual resource inventory classes can be determined in a spatial context by combining overlays for scenic quality, sensitivity levels, and Distance Zones, or by using a tabular matrix as shown in BLM VRM Manual 8400 Illustration 11, presented below as Table 3). Both were used in this analysis. Where VRI components were determined to be between two categories, the higher of the categories was used for the purposes of this analysis.

Table 3 delineates VRM classifications through any combination of scenic quality, sensitivity levels, and distance zones. To determine a VRM classification, each SQRU's scenic quality, sensitivity level and distance zone are charted and the point where all three values intersect identifies the VRM classification.

TABLE 3
DETERMINING VISUAL RESOURCES INVENTORY CLASSES – BLM MANUAL 8410 ILLUSTRATION 11

		Visual Sensitivity Levels						
		High			Medium			Low
Special Areas		I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III* IV*	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
		f/m	b	s/s	f/m	b	s/s	s/s
		DISTANCE ZONES						

* If adjacent areas is Class III or lower assign Class III, if higher assign Class IV

In addition to using Table 3, Figure A-3 is a GIS-based graphic showing VRI components overlaid in each SQRU. Because SQRU 001 includes a greater number of layers, it is likely that an Interim VRM Classification higher than the other SQRUs would be warranted. The tabular matrix verifies this.

As summarized in Table 4, SQRU 001 was determined to be VRM Class III and both SQRU 002 and SQRU 003 were determined to be VRM Class IV.

TABLE 4
Interim VRM Classifications

SQRU	Scenic Quality	Sensitivity Level	Distance Zone	Interim VRM Classification
001	B	M	F/M	III
002	C	L	F/M	IV
003	C	M/L	F/M	IV

Notes:

M = moderate

L = low

F/M = foreground / middleground

These interim VRM Classifications were determined using BLM Manual 8400 and are consistent with Instruction Memorandum No. 2009-043 (BLM 2009), which emphasizes that VRM Classifications be especially considered in areas where the National Renewable Energy Laboratory wind data shows Class 5 or higher. Because all 3 SQRUs are almost

exclusively Class 5 or higher, consideration was given to the resource management constraints relative to VRM classification.

6.0 Contrast Rating

The visual assessment previously prepared for the project identified seven KOPs used to serve as representative viewpoints for the more sensitive viewers in the project's viewshed as shown on Figure A-2. The seven KOPs include:

- KOP 1: View to the east from a location along the Pacific Crest National Scenic Trail. This viewpoint was selected to represent views toward the northern portion of the project site, which includes public lands administered by BLM, from the nearest formally managed recreation area.
- KOP 2: View to the northwest from within the rural residential area located at the eastern entrance to the Tehachapi Pass. This viewpoint was selected to show the view into Tehachapi Pass from the most proximate residential area. The land on which the turbines would be located, beyond the visible residences, is administered by BLM.
- KOP 3: View to the southeast from within the rural residential area located near the eastern entrance to the Tehachapi Pass. This viewpoint was selected to show the view toward the easternmost portion of the project site, which would be on land administered by BLM.
- KOP 4: View to the west from the westbound lane of SR 58, east of Randsburg Cutoff Road. This viewpoint was selected to show a wider view into Tehachapi Pass from the most heavily traveled roadway within the project area. Lands visible to the north and south of the highway are administered by BLM.
- KOP 5: View to the west from Midland Trail at Sequoia Boulevard. This viewpoint is near the intersection of SR 14 and SR 58, segments of each to the north and east of the intersection respectively are eligible for designation as state scenic highways. The nearest portions of the project site are administered by BLM.
- KOP 6: View to the northwest from Mojave West Park in Mojave. This viewpoint was selected to represent views toward the southern portion of the project site from the nearest areas of any residential density. The portion of the project site primarily visible from this location is administered by BLM.
- KOP 7: View to the northwest from the Oak Creek Road overpass of the SR 58 business route. This viewpoint was selected to show an elevated view from west Mojave. Lands within the project site administered by BLM appear across the majority of this view.

Simulations were prepared for each of the seven KOPs and are included in Appendix D, alongside photographs showing existing views, and panoramic images created for this analysis, showing each view within its wider landscape context. Additionally, the IDT completed contrast rating sheets (BLM Form 8400-4) for each of the KOPs. Completed sheets are included in Appendix E and summarized below. The letters at the tops of the columns

indicate the variables that were taken into account in evaluating contrast. These variables were form (F), line (L), color (C), and texture (T) and were evaluated for the land/water body, vegetation, and structures present within in KOP. For each KOP, there are two rows of data representing the rating scores assigned by the evaluators whose initials are indicated in the first column. For each KOP, the scores given by the two members of the IDT were considered in assigning an overall degree of contrast per KOP.

TABLE 5

CONTRAST RATING BY KOP

Evaluator	Land/Water Body				Vegetation				Structures			
	F	L	C	T	F	L	C	T	F	L	C	T
KOP 1												
JH	W	M	W	W	W	W	W	W	S	S	S	S
CLB	W	M	M	W	W	W	W	W	S	S	S	M
Overall	W	M	M/W	W	W	W	W	W	S	S	S	S/M
KOP 2												
JH	W	M	W	W	W	W	W	W	S	S	S	S
CLB	W	W	W	W	W	W	W	W	S	S	S	S
Overall	W	M/W	W	W	W	W	W	W	S	S	S	S
KOP 3												
JH	W	W	W	W	W	W	W	W	M	S	S	S
CLB	W	W	W	W	N	M	W	M	S	M	S	S
Overall	W	W	W	W	W/N	M/W	W	M/W	S/M	S/M	S	S
KOP 4												
JH	M	M	W	W	W	W	W	W	S	S	M	M
CLB	W	M	W	M	W	W	W	W	M	S	S	M
Overall	M/W	M	W	M/W	W	W	W	W	S/M	S	S/M	M
KOP 5												
JH	M	W	W	M	W	W	W	W	M	S	S	M
CLB	W	M	W	M	W	W	W	W	S	S	S	S
Overall	M/W	M/W	W	M	W	W	W	W	S/M	S	S	S/M
KOP 6												
JH	M	W	W	M	W	W	W	W	M	S	S	M
CLB	W	W	W	W	W	W	W	W	S	S	S	M
Overall	M/W	W	W	M/W	W	W	W	W	S/M	S	S	M

TABLE 5

CONTRAST RATING BY KOP

Evaluator	Land/Water Body				Vegetation				Structures			
	F	L	C	T	F	L	C	T	F	L	C	T
KOP 7												
JH	W	W	W	W	W	W	W	W	W	M	M	W
CLB	W	W	W	M	W	W	W	W	M	M	M	M
Overall	W	W	W	M/W	W	W	W	W	M/W	M	M	M/W

6.1 KOP 1

Proposed turbines would be prominently visible in unobstructed views toward the northern portion of the project site from the PCT, as seen in the view from KOP 1. The view from KOP 1 toward the project area includes SQRU 001, which was designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), the landform visible in the existing view – ridgelines and rolling hills dropping down to the desert valley floor – would not be substantially altered by the project beyond the portions that would be obscured by turbines. Nor would the mostly scrub-like vegetation appear different. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines, which would appear in front of and above the SR 58 corridor which itself includes a somewhat discordant series of structures. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast would be moderate.

6.2 KOP 2

In views to the west from within the residential area north of SR 58, the closest turbines would be visible in the foreground, near the westernmost residences, as seen from KOP 2. The view from KOP 2 toward the project area includes SQRU 001, designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), the proposed project would have little effect on the rugged, patchy landform and vegetation evident in the existing view. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines, which would obscure a minor portion of the foothills and ridgeline visible throughout the view. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast would be moderate.

6.3 KOP 3

In views to the southeast from within the residential area north of SR 58, turbines would appear in the foreground and middleground across a substantial portion of the view, atop

the foothills south of SR 58, as shown in KOP 3. The view from KOP 3 toward the project area includes SQRU 001, designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), the existing landform visible from this location would be accentuated somewhat by the project in that the turbines would appear atop the minor ridgeline closest to the viewpoint; however, neither the existing landform nor vegetation would appear substantially different with the project. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines, which would appear above the discernable landscape in this view. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast was identified to be moderate.

6.4 KOP 4

Turbines would also appear on both sides of SR 58 in views from the westbound lane of the highway, both atop the ridgeline to the south and amid the foothills to the north, as shown in KOP 4. The view from KOP 4 toward the project area includes SQRU 001, designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), the proposed turbines would reinforce the ridgeline visible south of SR 58, while partially obscuring portions of the more distant slopes. The turbines would not substantially alter existing landform or vegetation. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines, which would add a stronger vertical component to the view. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast was identified to be moderate.

6.5 KOP 5

KOP 5 is located adjacent to the southbound lane of SR 14, just south of the SR 14 / SR 58 intersection. Proposed turbines would appear both closer and larger than the older turbines visible in existing views from KOP 5. The series of turbines that would be visible across the majority of the middleground view would in part be visible above the mountain skyline and would also partially obstruct views toward the foothills area beyond the desert floor. The view from KOP 5 toward the project area includes SQRUs 002 and 003, both designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), the numerous turbines visible from this distance would render some of the lower foothill ridgelines difficult to discern, though the general form of the mountains would remain prominent. The vegetation in the foreground – the only area where individual plants are identifiable – would be unaffected by the project. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines, which would appear more than 3 miles away from this viewpoint. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast was identified to be moderate.

6.6 KOP 6

Views toward the project site from areas within and near Mojave include existing wind energy facilities, as shown in KOP 6, located at Mojave West Park. The proposed project

would result in an increase in the number of visible turbines. The view from KOP 6 toward the project area includes SQRUs 002 and 003, both designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), while the proposed turbines would appear in front of the mountain range, landform remains the view's dominant feature, and the diverse vegetation visible in the view's foreground would remain unchanged. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines which, in concert with existing turbines, extend across the entire view with the project, appearing beyond the desert floor and within the mountain foothills. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast was identified to be moderate.

6.7 KOP 7

Views toward the project site from areas within and near Mojave include existing wind energy facilities, as shown in KOP 6, located at Oak Creek Road. The proposed project would result in an increase in the number of visible turbines. The view from KOP 7 toward the project area includes SQRUs 002 and 003, both designated on an interim basis as VRM Class III. As described in contrast rating sheets completed for this view (see Appendix E), given the distance between turbines and viewpoint, landscape features are only slightly altered in this view; there are no visible effects on vegetation and the mountain backdrop remains the dominant component of the view. The strongest contrast in this viewpoint is caused by the introduction of the project wind turbines, which would enlarge the portion of the visible wind development in the foothills that already extends across most of the view. However, at the distance shown in KOP 7, project development results in a moderate contrast rating. Because the project involves minimal grading and vegetation removal, contrast to landform and vegetation between the existing view and proposed view is predominantly weak. Therefore, the degree of contrast was identified to be moderate/weak.

6.8 Conclusion

SQRU 001, classified on an interim basis as Class III, is visible in views from KOPs 1-4. Class III is intended to partially retain the existing character of the landscape. Changes to the landscape character may begin to attract attention but should not dominate the visual setting. Because the project would have a moderate degree of contrast as viewed from KOPs 1-4, the project is consistent with the objectives of VRM Class III.

SQRUs 002 and 003, both classified on an interim basis as Class IV, are visible in views from KOPs 5-7. Class IV is intended to allow for activities that modify the existing character of the landscape. Changes to the landscape character may attract attention and dominate the visual setting. However, these activities should minimize changes to the landscape where possible. Because the project would have a moderate or lower degree of contrast as viewed from KOPs 5-7, the project is consistent with the objectives of VRM Class IV.

Because simulated views of the project are consistent with VRM objectives from all selected KOPs, the project itself is consistent with VRM objectives.

7.0 BLM Best Management Practices

The BLM, in its *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States* (BLM, 2005), specified a number of Best Management Practices (BMPs) that are intended to reduce visual impacts from wind energy projects on public aesthetic resources. The BMPs incorporated into the proposed project include the following:

- Turbine arrays and the turbine design should be integrated with the surrounding landscape. To accomplish this integration, several elements of design need to be incorporated.
 - The operator should provide visual order and unity among clusters of turbines (visual units) to avoid visual disruptions and perceived “disorder, disarray, or clutter” (Gipe, 2002).
 - To the extent possible given the terrain of a site, the operator should create clusters or groupings of wind turbines when placed in large numbers; avoid a cluttering effect by separating otherwise overly long lines of turbines, or large arrays; and insert breaks or open zones to create distinct visual units or groups of turbines.
 - The operator should create visual uniformity in the shape, color, and size of rotor blades, nacelles, and towers (Gipe, 1998).
 - The use of tubular towers is recommended. Truss or lattice-style wind turbine towers with lacework, pyramidal, or prism shapes should be avoided. Tubular towers present a simpler profile and less complex surface characteristics and reflective/shading properties.
 - Components should be in proper proportion to one another. Nacelles and towers should be planned to form an aesthetic unit and should be combined with particular sizes and shapes in mind to achieve an aesthetic balance between the rotor, nacelle, and tower (Gipe, 1998).
 - Color selections for turbines should be made to reduce visual impact (Gipe, 2002) and should be applied uniformly to tower, nacelle, and rotor, unless gradient or other patterned color schemes are used.
 - The operator should use non-reflective paints and coatings to reduce reflection and glare. Turbines, visible ancillary structures, and other equipment should be painted before or immediately after installation. Uncoated galvanized metallic surfaces should be avoided because they would create a stronger visual contrast, particularly as they oxidize and darken.
 - Commercial messages on turbines and towers should be prohibited (Gipe, 2002).
- The site design should be integrated with the surrounding landscape.
 - To the extent practicable, the operator should avoid placing substations or large operations buildings on high land features and along “skylines” that are visible from nearby sensitive view points. The presence of these structures should be concealed

or made less conspicuous. Conspicuous structures should be designed and constructed to harmonize with desirable or acceptable characteristics of the surrounding environment (Gipe, 2002).

- The operator should bury power collection cables or lines on the site in a manner that minimizes additional surface disturbance.
- Commercial symbols (such as logos), trademarks, and messages should not appear on sites or ancillary structures of wind energy projects. Similarly, billboards and advertising messages should also be prohibited (Gipe, 1998, 2002).
- Site design should be accomplished to make security lights nonessential. Such lights increase the contrast between a wind energy project and the night sky, especially in rural/remote environments, where turbines would typically be installed. Where they are necessary, security lights should be extinguished except when activated by motion detectors (e.g., only around the substation) (Gipe, 1998).
- Operators should minimize disturbance and control erosion by avoiding steep slopes (Gipe, 1998) and by minimizing the amount of construction and ground clearing needed for roads, staging areas, and crane pads. Dust suppression techniques should be employed in arid environments to minimize impacts of vehicular and pedestrian traffic, construction, and wind on exposed surface soils. Disturbed surfaces should be restored as closely as possible to their original contour and revegetated immediately after, or contemporaneously with construction. Action should be prompt to limit erosion and to accelerate restoring the preconstruction color and texture of the landscape.
- The wind development site should be maintained during operation. Inoperative or incomplete turbines cause the misperception in viewers that “wind power does not work” or that it is unreliable. Inoperative turbines should be completely repaired, replaced, or removed. Nacelle covers and rotor nose cones should always be in place and undamaged (Gipe, 1998). Wind energy projects should evidence environmental care, which would also reinforce the expectation and impression of good management for benign or clean power. Nacelles and towers should also be cleaned regularly (yearly, at minimum) to remove spilled or leaking fluids and the dirt and dust that would accumulate, especially in seeping lubricants. Facilities and off-site surrounding areas should be kept clean of debris, “fugitive” trash or waste, and graffiti. Scrap heaps and materials dumps should be prohibited and prevented. Materials storage yards, even if thought to be orderly, should be kept to an absolute minimum. Surplus, broken, disused materials and equipment of any size should not be allowed to accumulate (Gipe, 2002).
- A decommissioning plan should be developed, and it should include the removal of all turbines and ancillary structures and restoration/reclamation of the site.

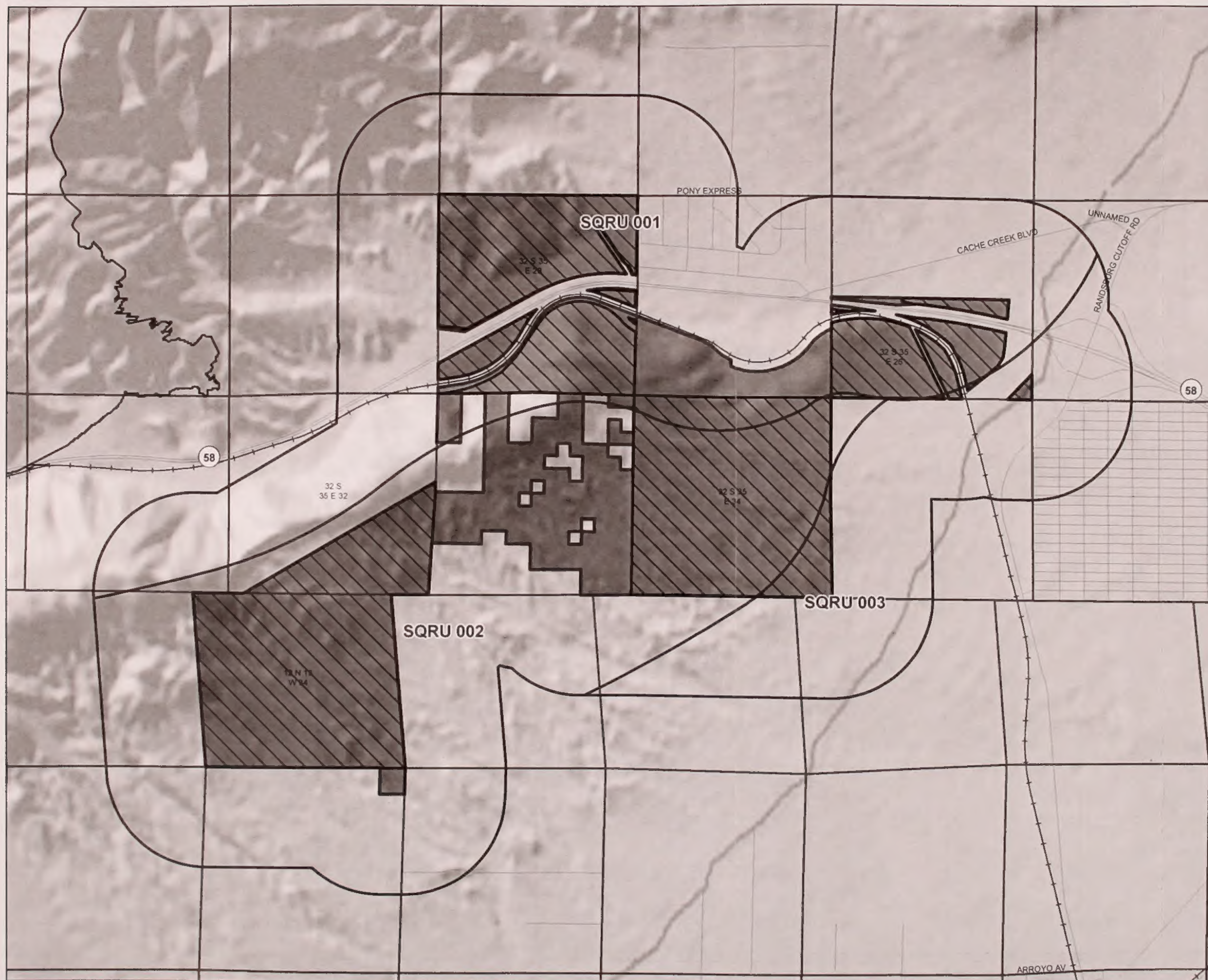
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Appendix A

Figures



- Scenic Quality Rating Units (including 1/2 mile buffer)
- Federal Lands
- Project Area
- Pacific Crest Trail

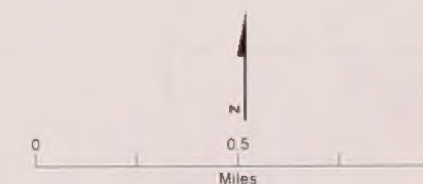


FIGURE A-1
Scenic Quality Rating Units
 Alta East Wind Project
 Alta Wind Energy Center Project



- Key Observation Point (KOP) and View Orientation
- Proposed Wind Turbine Layout
- Proposed Access Road
- Scenic Quality Rating Units
- Federal Lands
- Project Area
- Pacific Crest Trail

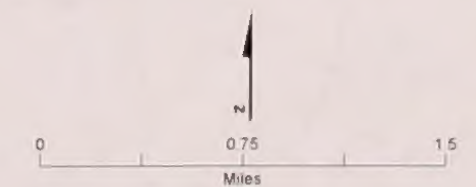
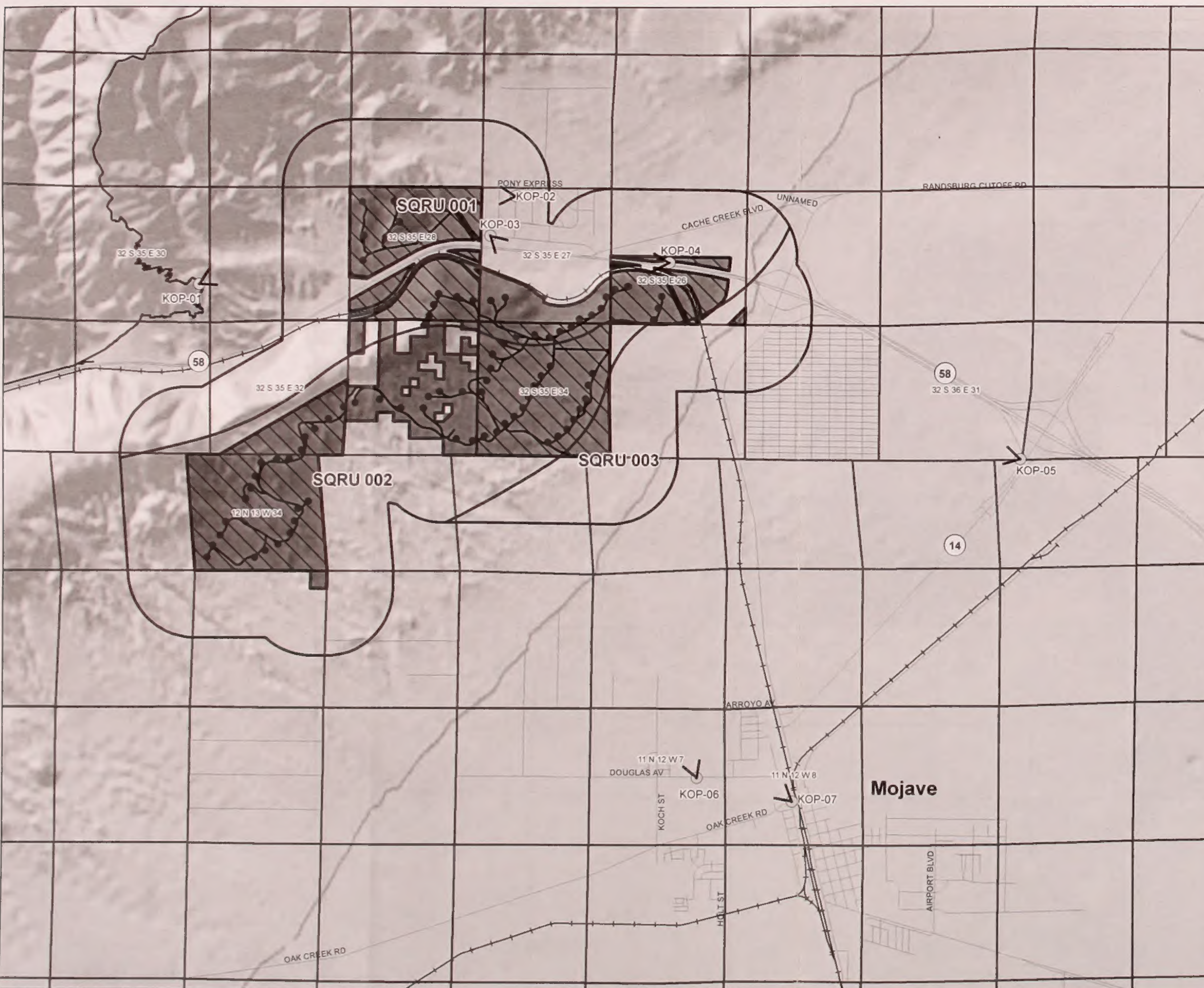


FIGURE A-2
Key Observation Points
 Alta East Wind Project
 Alta Wind Energy Center Project



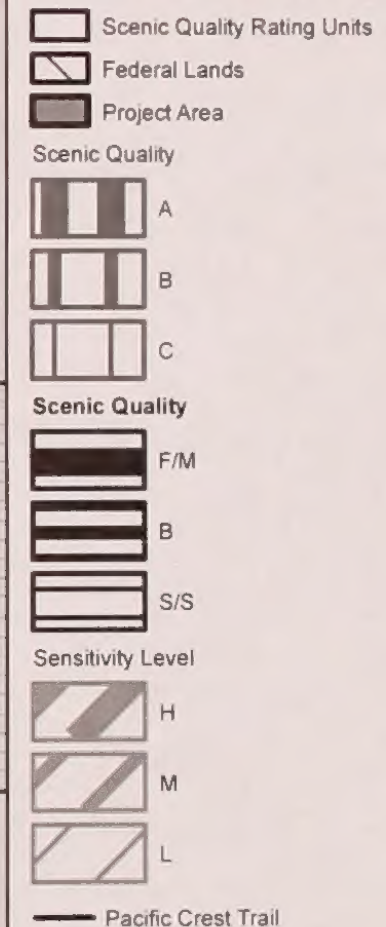
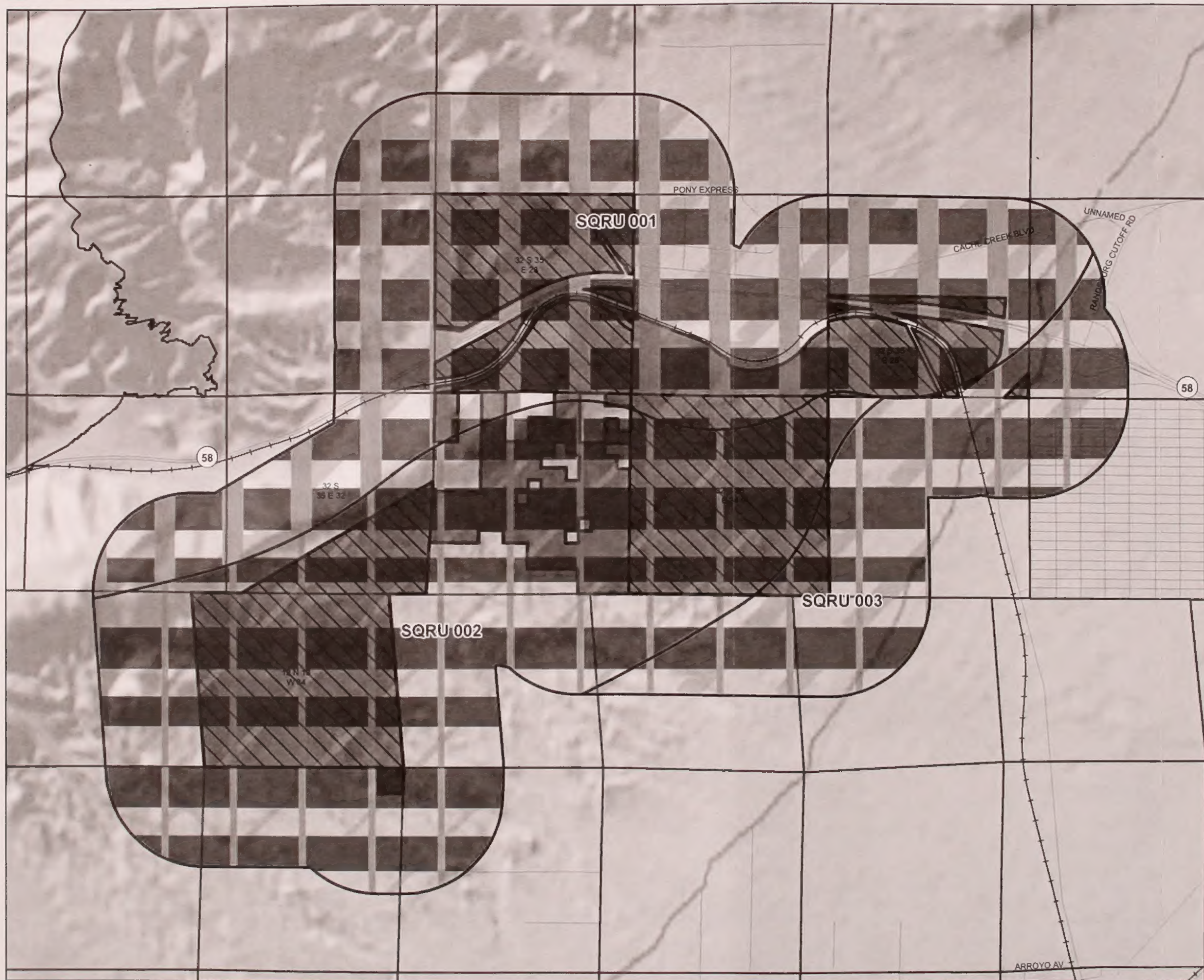


FIGURE A-3
Interim VRM Classifications
 Alta East Wind Project
 Alta Wind Energy Center Project

Appendix B
Visual Resource Inventory Sheet

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 27 JUNE 2011

District

Resource Area

Scenic quality rating unit

TEHACHAPI PASS

1. Evaluators (names)

Josh Hohn

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	EASTERN TEHACHAPI RISE UP FROM VALLEY FLOOR W/ VARIOUS DEGREES OF SLOPE. NO WATER.	Joshua TREES	VALUED IN BUFFER AREA. TURBINES W/IN ELM LAND; REMAINS NEARBY
LINE	MAJOR, MINOR RIDGELINES	NO LINEAR VEG.	SR58, R.R., LINEAR TRANSMISSION
COLOR	EAST FACING SLOPES REFLECT COLOR FULLY IN MORNING SUN → ORANGES, LIGHT REDS	VEG. IS PRIMARY SOURCE OF CONSISTENT COLOR	GRAN ROAD, CHANGES VARY (WHITE TURBINES)
TEXTURE	ROCK OLCROPPINGS, SLOPE TRES VISIBLE SLOPES ARTICULATED → TEXTURE ADDS INTEREST	Joshua TREES ADD COMPLETENESS	UNEVEN

3. Narrative

THIS SQRU IS THE ONE WITH THE GREATEST NUMBER OF VIEWERS, GIVEN THE LOCATION OF SR58 WITHIN IT. TEHACHAPI ARE VISIBLE WITH GREATEST DEGREE OF RELIEF HERE. THE COLOR AND SOMEWHAT DRAMATIC TEXTURE OF EASTERN SLOPES ARE VISUALLY PLEASING BUT NOT ATYPICAL OF THIS PART OF CALIFORNIA. EXISTING TURBINES ARE VISIBLE IN SOME VIEWS TO THE WEST FROM WITHIN SQRU.

4. SCORE (Circle Appropriate Level)*

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	(3)	1	TEXTURED, COLORFUL RIDGELINES
b. Vegetation	5	3 (2)	1	Joshua TREES
c. Water	5	3	(0)	NO WATER
d. Color	5	(3)	1	HILLS TO NORTH OF SR58
e. Adjacent Scenery	5	(3)	0	LAND TO NORTH
f. Scarcity	5+	(3)	1	
g. Cultural Modification	2	0	(-1) -4	EXISTING TURBINES
TOTALS		+ 14	+ -3	= 11

SCENIC QUALITY CLASSIFICATION

- ☐ A 19 or more
☐ B - 12-18
☒ C - 11 or less

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SCENIC QUALITY FIELD INVENTORY

Date 6.27.2011

District CA DESERT

Resource Area VISUAL RESOURCES

Scenic quality rating unit

001 TEHACHAPI PASS

1. Evaluators (names)

CORINNE LYLE BONINE

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	UNIQUE FORM W/ MOUNTAINS AGAINST SKY	JOSHUA TREES AND LARGE VEGETATION	WEIGH STRUCTURES BOX-LIKE, TRANSMISSION LINE
LINE	HORIZONTAL & DIAGONAL AGAINST SKYLINE	PREDOMINANTLY VERTICAL FROM J-TREES	ALONG RR - MOSTLY LINEAR ROADS/HIGHWAY/ RR CREATE BOTH HORIZONTAL & DIAGONAL LINES, T-JUNCTION = VERTICAL
COLOR	GRAY AND BROWN/TAN EARTH COLORS BUT CAN APPEAR PINKISH IN AN SUN	SPARSE YELLOW/WHITE PURPLES WITH PREDOMINANTLY GREEN/BROWN	METAL, BROWNS/ TANS, BLACK AND MUCH LIGHTER DIRT ROADS
TEXTURE	MOUNTAIN TOPOGRAPHY & DRAINAGES	JOSHUA TREES & OTHER LARG. SCRUBS	SCATTERED BUILDINGS, VERTICAL ELEMENTS & HORIZONTAL/DIAGONAL ROADS ADD TEXTURE

3. Narrative

WHILE CULTURAL MODIFICATIONS ARE PRESENT, SCENIC
QUALITY OF LAND FORM AND VEGETATION ARE
INTERESTING & RELATIVELY COLORFUL. SQRU001
SIMILARLY CONTAINS DIVERSE, SCENIC, TEXTURE

4. SCORE (Circle Appropriate Level) *

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5 (1)	3	1	HIGH, COLORFUL MT. RELIEF
b. Vegetation	5	(3)	1	BRIGHT GREENS & LOT'S
c. Water	5	3	(0)	NO WATER
d. Color	5	(3)	1	CONTRAST W/ LAND & VEG.
e. Adjacent Scenery	5	(3)	0	N. SQRU UNDEVELOPED
f. Scarcity	5+	3 (1)	1	SIMILAR ADJACENT
g. Cultural Modification	2	0	(1) 4	ROAD, RR, STRUCTURES
TOTALS	4 + 9 + 0 = 13			

SCENIC QUALITY
CLASSIFICATION

☐ A 19 or more

☒ B - 12-18

☐ C - 11 or less

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 27 JUNE 2011
District _____
Resource Area _____
Scenic quality rating unit
TEHACAPI FOOTHILLS

1. Evaluators (names)

Josh Hohn

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	GRAVIAL SLOPING AWAY FROM DESERT	FEW JOSHUA TREES	SCATTERED PARCELS w/ TURBINES & STRUCTURES - VEHICLES NEARBY, NOT W/ IN
LINE	GULLEYS FORMED BY RUNOFF	SCATTERED FEW	ROADS - PSEUDO-GRID PATTERN EVIDENT
COLOR	MOSTLY EARTHTONES, SOME REDDISH SOILS - DISTINCT FROM SURROUNDING AREA	SPARSE BITS OF VEG COLOR AMONG REDDISH SOILS	MOSTLY BLEND IN W/ TERRAIN
TEXTURE	RIVULETS, GULLEYS, MINOR RIDGELINES	COARSE WHERE EVIDENT	TERRAIN + TURBINES = UNEVEN OVERALL TEXTURE

3. Narrative

THE SOUTHERN EXTENT OF THIS SQRU INCLUDES MANY PREVIOUSLY CONSTRUCTED TURBINES. THE FOOTHILLS SERVE AS BACKDROP TO VALLEY FLOOR IN VIEWS FROM THE POPULATED AREAS / HIGHWAYS TO THE EAST. THIS IS A RUGGED LANDSCAPE THAT REGARDLESS INCLUDES AMPLE EVIDENCE OF MODIFICATION (TURBINES, ROADS).

4. SCORE (Circle Appropriate Level)*

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3 <u>2</u>	1	VARIED, UNEVEN TEXTURE
b. Vegetation	5	3 <u>2</u>	1	JOSHUA TREES
c. Water	5	3	<u>0</u>	NO WATER
d. Color	5	3 <u>2</u>	1	
e. Adjacent Scenery	5	3	<u>0</u>	FLAT DESERT FLOOR
f. Scarcity	5+	3	<u>1</u>	
g. Cultural Modification	2	0	<u>2</u>	
TOTALS		+ 6 + 0 = 6		

SCENIC QUALITY CLASSIFICATION

- ☐ A 19 or more
☐ B 12-18
☒ C 11 or less

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SCENIC QUALITY FIELD INVENTORY

Date 6.27.2011
District CA DESERT
Resource Area VISUAL RESOURCES
Scenic quality rating unit
002 TEHACHAPI FOOTHILLS

1. Evaluators (names)

CORINNE LYLE BONINE

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	FOOTHILL FORM LESS DYNAMIC AGAINST SKY - ALSO APPEARS IN FRONT OF HIGHER DISTANT LANDFORMS	RELATIVELY SPARSE & NON-CONTRIBUTING TO FORM	PROVIDES INTERRUPTIONS TO HILLSIDE FORM
LINE	VEG. LINE, HORIZONTAL/ DIAGONAL	SEPARATES DIVIDE SOPH - VEG LINE HORIZONTAL	VERTICAL TURBINES; HORIZONTAL/DIAGONAL DIRT ROADS
COLOR	GRAYS & BROWNS	SPARSE GREENS. PREDOMINANTLY BROWNS	WHITE, METAL LIGHT TAN (DIRT ROADS)
TEXTURE	DRAINAGES, ROLLING HILLS PROVIDE LESS TEXTURE	SPARSITY OF VEG. GENERATES LESS TEXTURE	PROVIDES TEXTURE AGAINST SKY & LANDFORM (TURBINES, ROADS RESPECTIVELY)

3. Narrative

SOPH 002 IS CREATED BY VEGETATION LINE, SEPARATING
RELATIVELY DENSE VEG. ON DESERT FLOOR W/ MUCH
SPARSE VEG ON HILL SIDE. SOPH ALSO INCLUDES
EXISTING TURBINES & OTHER MODIFICATIONS.

4. SCORE (Circle Appropriate Level)*

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE	SCENIC QUALITY CLASSIFICATION
a. Landform	5	3	1	LESS DYNAMIC BUT STILL HIGH	☐ A 19 or more ☐ B - 12-18 ☒ C - 11 or less
b. Vegetation	5	3	1	SPARSE IN COMPARISON	
c. Water	5	3	0	NO WATER	
d. Color	5	3	1	LESS GREENS, BLENDS IN	
e. Adjacent Scenery	5	3	0	HIGHER, DYNAMIC RIDGES	
f. Scarcity	5+	3	1	COMMON LANDSCAPE	
g. Cultural Modification	2	0	4	PRINCIPALLY ROADS/TURBINES	
TOTALS	0 + 0 + 8 = 8				

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 27 JUNE 2011

District

Resource Area

Scenic quality rating unit

DESERT FLOOR

1. Evaluators (names)

JOSH HOHN

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	FLAT	SCATTERED, SPARSE	MOSTLY LINEAR INFRASTRUCTURE, SOME BUILDINGS / RESIDENCES
LINE	BASE OF FOOTHILLS	UNEVEN	TRANSMISSION LINES, AQUEDUCT, ROADS
COLOR	SOME VEGETATION, MOSTLY GRAY / TAN EARTH TONES	PRIMARY SOURCE OF NON-EARTH COLOR IN LANDSCAPE	TEND TO BLEND IN W/ LANDSCAPE TO A CERTAIN EXTENT
TEXTURE	COARSE, DUE TO DESERT SCRUB	JOSHUA TREES - COARSE	SCATTERED HOMES / OTHER BUILDINGS, PLUS INFRASTRUCTURE RESULTS IN UNEVEN LANDSCAPE

3. Narrative

DEVELOPMENT / MODIFICATIONS ARE VISIBLE THROUGHOUT THIS FLAT LANDSCAPE, WHICH INCLUDES ONLY A SMALL PORTION OF BLM LAND. CLUSTERS OF RESIDENCES, TRANSMISSION LINES, ROADS, THE LADWP AQUEDUCT, A RAIL LINE, AND THE TOWN OF MOJAVE ARE WITHIN THIS GENERAL AREA. THE TENACHAPI FOOTHILLS SCRUB APPEARS AS BACKGROUND, BEYOND / ABOVE VALLEY FLOOR IN VIEWS TO THE WEST.

4. SCORE (Circle Appropriate Level)*

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3	(1)	
b. Vegetation	5	3	(2) 1	JOSHUA TREES
c. Water	5	3	(0)	NO WATER
d. Color	5	3	(1)	
e. Adjacent Scenery	5	3	(2) 0	FOOTHILLS
f. Scarcity	5+	3	(1)	
g. Cultural Modification	2	0	(1) 1	
TOTALS		+ 4	+ 2 = 6	

SCENIC QUALITY CLASSIFICATION

☐ A 19 or more

☐ B 12-18

☒ C 11 or less

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 6.27.2011
District CA DESERT
Resource Area VISUAL RESOURCES
Scenic quality rating unit
003 DESERT FLOOR

1. Evaluators (names)

CORINNE LYLE BONINE

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	SLOW INCLINE UNTIL BASE OF FOOTHILLS	DENSE, RELATIVELY	MOSTLY LINEAR; SOME STRUCTURES
LINE	NO DRAINAGES CREATE BOTH HORIZONTAL & DIAGONAL	FORMS LINE DIVIDING SGRU - ADDTL TREES ARE VERTICAL	HORIZONTAL & DIAGONAL ROADS & STRUCTURES
COLOR	BROWNS/TANS - FEW TO NO ROCK OUTCROPS	PURPLES/WHITES/ YELLOW SPARKS; GREENS COMMON	BROWN/TANS; AGED METALS
TEXTURE	LANDFORM HAS UNIFORM TEXTURE W/ EXCEPTION OF DRAINAGES	INTERESTING TEXTURE & LINES BACKDROP AGAINST HILLS	ROADS/STRUCTURES PROVIDE TEXTURE

3. Narrative

SGRU 003 HAS CULTURAL MODIFICATIONS PRESENT BUT
DENSITY & TEXTURE OF VEGETATION GIVE IT A
HIGHER SCENIC QUALITY. LANDFORM
RELATIVELY UNIFORM & UNINTERESTING AND
ADJACENT SCENERY CONTAINS HEAVY CULTURAL
MODIFICATIONS

4. SCORE (Circle Appropriate Level)*

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3	(1)	NO DISTINCT FORM - FLAT
b. Vegetation	5	(3)	1	DENSE & INTERESTING
c. Water	5	3	(0)	NO WATER
d. Color	5	(3)	1	BRIGHT GREENS & BROWNS
e. Adjacent Scenery	5	3	(0)	CLOSE TO RURAL DEV.
f. Scarcity	5+	3	(1)	COMMON LANDSCAPE
g. Cultural Modification	2	0	(4)	STRUCTURES, ROADS, ETC.
TOTALS		+ 6 + 3 = 9		

SCENIC QUALITY
CLASSIFICATION

- ☐ A 19 or more
☐ B - 12-18
☒ C - 11 or less

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date 27 JUNE 2011

District _____

Resource Area _____

SCENIC QUALITY RATING SUMMARY

1 Evaluators (names)

Josh Hohn

SCENIC QUALITY RATING UNITS (1)	Landform (2)	Vegetation (3)	Water (4)	Color (5)	Adjacent Scenery (6)	Scarcity (7)	Cultural Modification (8)	Total Score (9)	Scenic Quality Rating (10)	EXPLANATION (11)
001 - TEHACHAPI PASS	3	2	Ø	3	3	3	-3	11	C	COLOR/TEXTURE OF TEHACHAPI IS MOST EVIDENT HERE.
002 - TEHACHAPI FOOTHILLS	2	2	Ø	2	1	1	-2	6	C	RUGGED, BUT MODIFIED LANDSCAPE.
003 - DESERT FLOOR	1	2	Ø	1	2	1	-1	6	C	FLAT AREA INCLUDES VEGETATION; DISPERSED STRUCTURAL: LINEAR MODIFICATIONS WITHIN/NEARBY

INSTRUCTIONS

Form is used in conjunction with the Scenic Quality Inventory and Evaluation Chart

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date 6.27.2011

District CA DESERT

Resource Area VISUAL RESOURCES

SCENIC QUALITY RATING SUMMARY

1. Evaluators (names)

SCENIC QUALITY RATING UNITS (1)	Landform (2)	Vegetation (3)	Water (4)	Color (5)	Adjacent Scenery (6)	Scarcity (7)	Cultural Modification (8)	Total Score (9)	Scenic Quality Rating (10)	EXPLANATION (11)
001 TEHACHAPI PASS	4	3	0	3	3	2	-2	13	B =	UNIQUE LANDFORM FORM & COLOR AS WELL AS HIGER QUALITY ADJACENT SCENERY; INTERESTING VEGETATION
002 TEHACHAPI FOOTHILLS	2	2	0	2	2	2	-2	8	C =	SPARSITY OF VEGETATION & UNIFORM LANDFORM AND COLOR PRESENT + LOWER SCENIC QUALITY
003 DESERT FLOOR	1	3	0	3	2	2	-2	9	C =	WHILE COLORFUL VEGETATION ADDS HIGER QUALITY COLOR & TEXTURE, FLAT LANDFORM AND HEAVY ADJACENT CULTURAL MODIFICATIONS LOWER SCENIC QUALITY

INSTRUCTIONS

Form is used in conjunction with the Scenic Quality Inventory and Evaluation Chart.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date 27 JUNE 2011

District

Resource Area

SENSITIVITY LEVEL RATING SHEET

1. Evaluators (name)

JOHN HORN

SENSITIVITY LEVEL RATING UNIT (1)	Type of User (2)	Amount of Use (3)	Public Interest (4)	Adjacent Land Uses (5)	Special Areas (6)	Other Factors (7)	Overall Rating (8)	EXPLANATION (9)
SQRU 001 TEHACHA PASS	ML	ML	M	L	L	-	ML	MORE SCENIC ADJACENT AREAS; PACIFIC COAST TRAIL NEARBY (SQRU VISIBLE FROM SQRU)
SQRU 002 TEHACHA FOOTHILLS	L	L	L	L	L	-	L	LEAST ACCESSIBLE SQRU.
SQRU 003 DESERT FLOOR	L	L	ML	L	L	-	L	INCLUDES MOST HEAVILY ADJUTATED AREA, MOST ALTERED LANDSCAPE

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SENSITIVITY LEVEL RATING SHEET

Date 6.27.2011

District CA DESERT

Resource Area VISUAL RESOURCES

I. Evaluators (names)

CORINNE LITTLE BONINE

SENSITIVITY LEVEL RATING UNIT (1)	Type of User (2)	Amount of Use (3)	Public Interest (4)	Adjacent Land Uses (5)	Special Areas (6)	★ Other Factors (7)	Overall Rating (8)	EXPLANATION (9)
001 TEHACHAPI PASS	H/M	M	M	M	L	M	M	SQRM CONTAINS RURAL RESIDENTIAL STRUCTURES & PACIFIC CREST TRAIL.
002 TEHACHAPI FOOTHILLS	L	L	L	L	L	L	L	LOW USE NUMBERS; LIMITED ACCESS.
003 DESERT FLOOR	M	M	L	L	L	M	M/L	CONTAINS NEARBY RURAL RESIDENTIAL AND INCREASED ACCESS GIVES HIGHER USAGE
								★OTHER FACTORS INCLUDE A BALANCE W/ GENERAL ACCEPTANCE/DESENSITIVITY TO WIND DEVELOPMENT AND AN "ENOUGH IS ENOUGH" SENTIMENT

Appendix C

Visual Resources Inventory Photographs



FIGURE C-1
Representative Photographs of SQRU 001
Alta East Wind Project
Alta Wind Energy Center Project



FIGURE C-2
Representative Photographs of SQRU 001
Alta East Wind Project
Alta Wind Energy Center Project



FIGURE C-3

Representative Photographs of SQRU 002
Alta East Wind Project
Alta Wind Energy Center Project

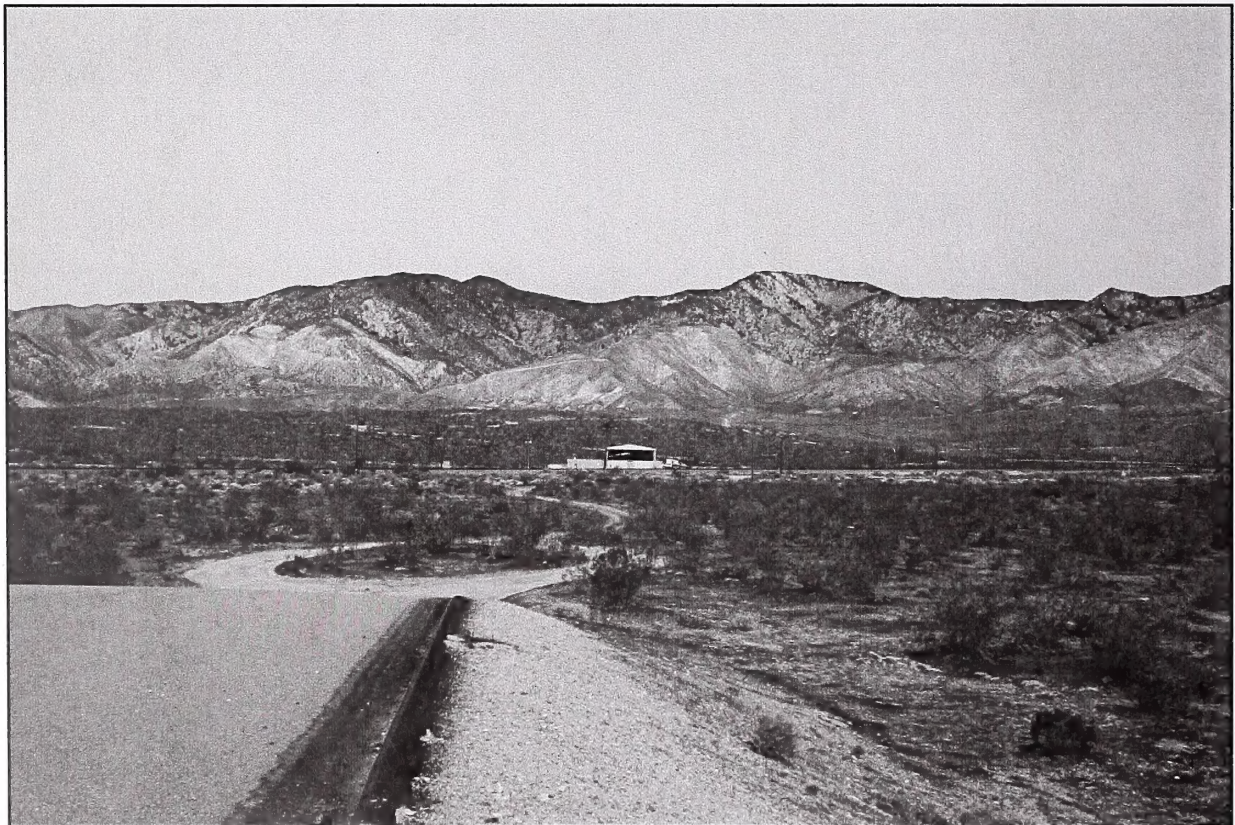


FIGURE C-4
Representative Photographs of SQRU 002
Alta East Wind Project
Alta Wind Energy Center Project

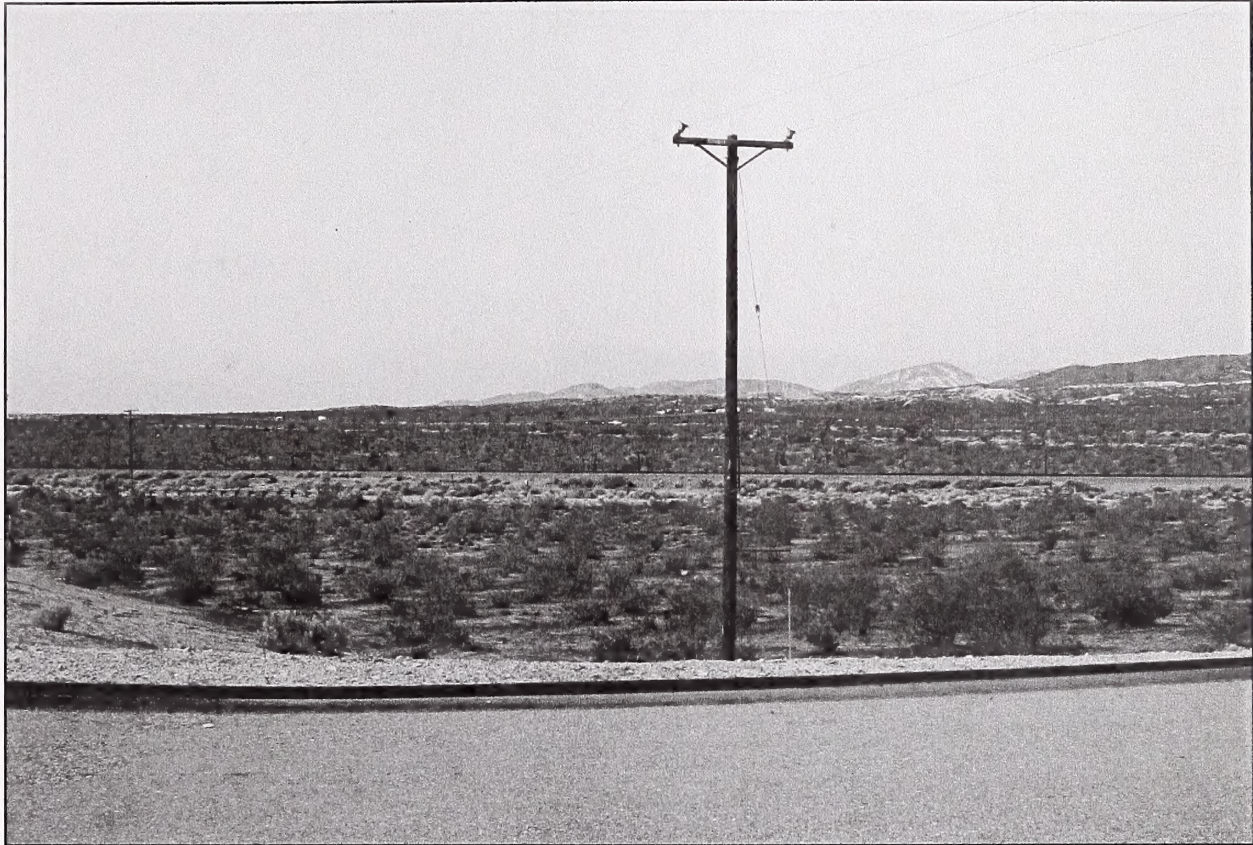


FIGURE C-5
Representative Photographs of SQRU 003
Alta East Wind Project
Alta Wind Energy Center Project

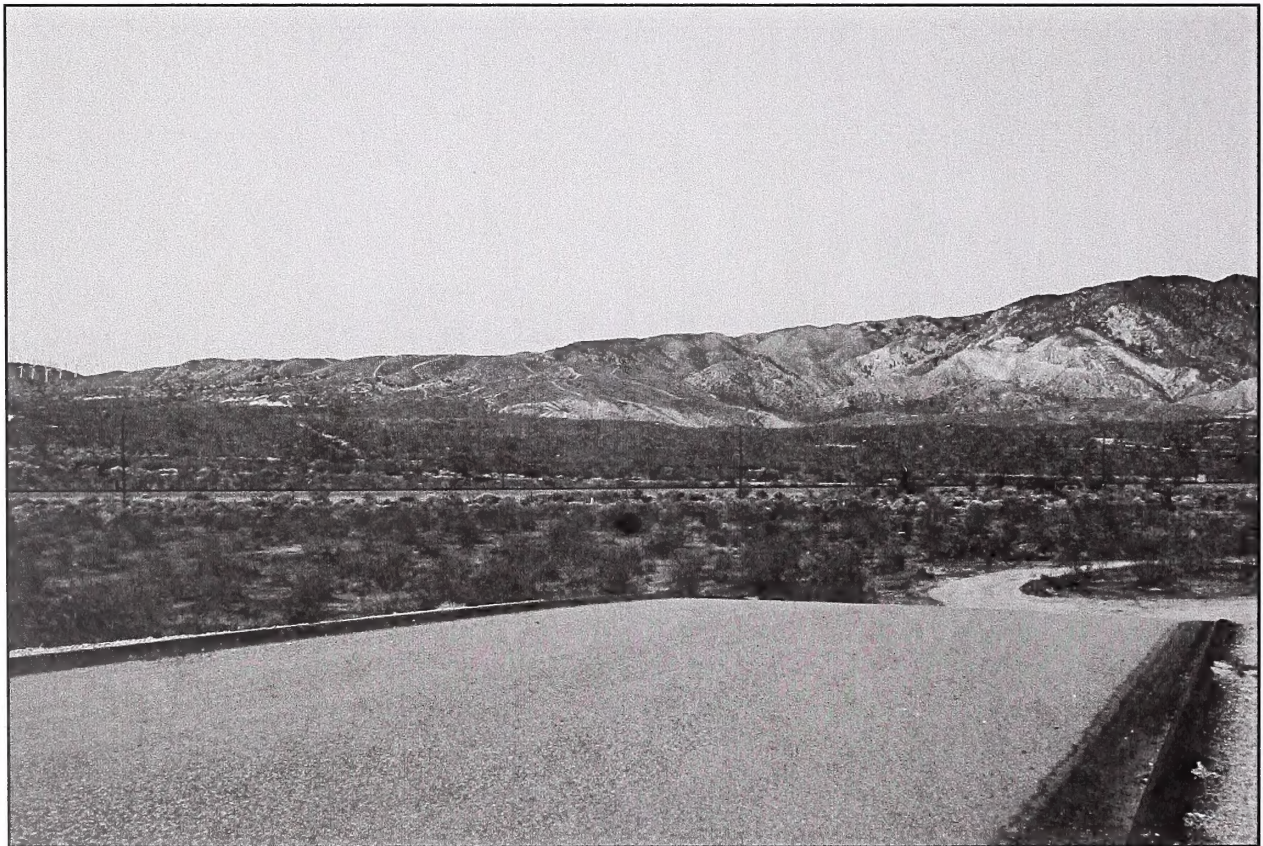


FIGURE C-6
Representative Photographs of SQRU 003
Alta East Wind Project
Alta Wind Energy Center Project

Appendix D

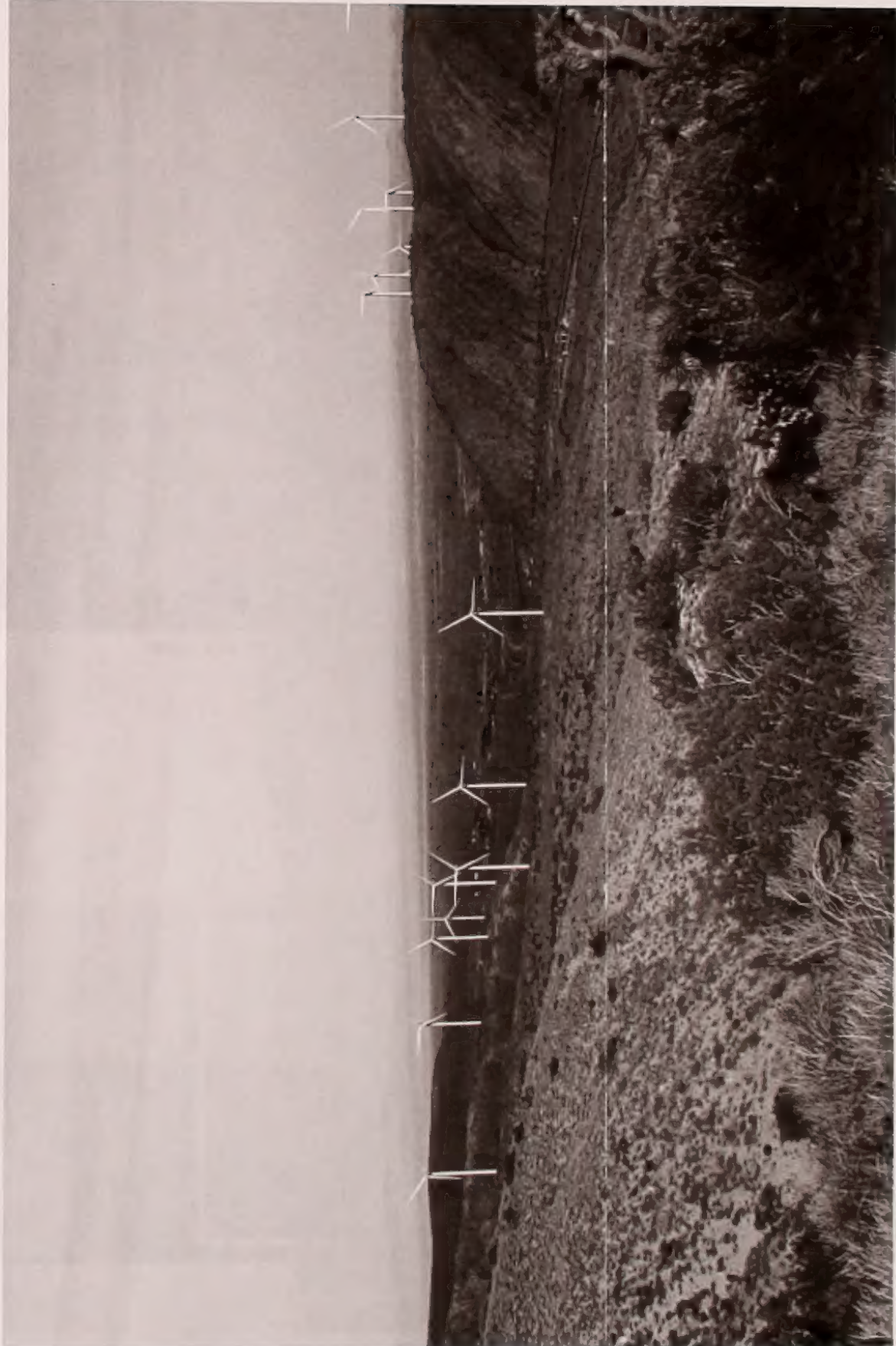
Simulations



FIGURE 18
ALTA EAST WIND PROJECT
JANUARY 2012
BY [illegible]



A. Existing View from KOP 1. View to the east from the Pacific Crest National Scenic Trail. This location is approximately 2 miles east of the trail access point at the Cameron Canyon Road overpass of SR 58. The rural residential area located at the eastern entrance to the Tehachapi Pass is visible near the center of the view. Portions of the project site visible from this location are managed by BLM.



B. View from KOP 1 with simulated Project. Alta East turbines would be visible across the middleground of the view, both north and south of SR 58.

FIGURE D-1

View from KOP 1
Alta East Wind Project
Alta Wind Energy Center Project



C. Panoramic existing view from KOP 1. Existing turbines south of SR 58 are visible in this view.



D. Location of single-frame image used for simulation within panoramic view.

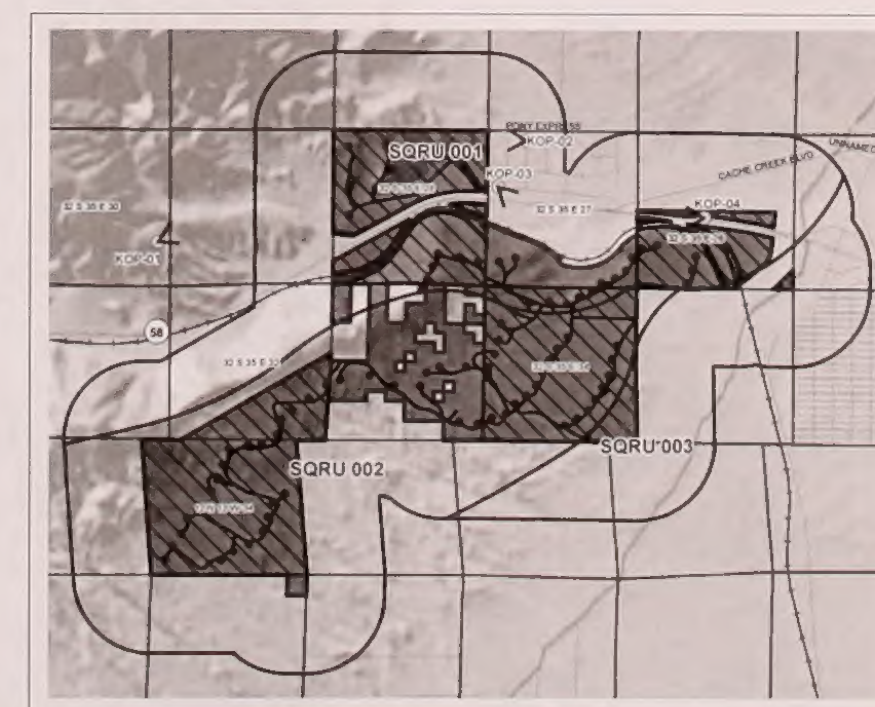


FIGURE D-1
View from KOP 1
Alta East Wind Project
Alta Wind Energy Center Project



A. Existing View from KOP 2. View to the northwest from location within rural residential area located at the eastern entrance to the Tehachapi Pass. The Pacific Crest National Scenic Trail passes through the mountains visible in this view's backdrop, approximately 3 miles away from the viewpoint. Portions of the project site visible from this location are managed by BLM.



B. View from KOP 2 with simulated Project. Alta East turbines would appear beyond Wildflower Canyon Road, just west of the rural residential area.

FIGURE D-2
View from KOP 2
Alta East Wind Project
Alta Wind Energy Center Project



C. Panoramic existing view from KOP 2. Existing turbines south of SR 58 are visible in this view.



D. Location of single-frame image used for simulation within panoramic view.

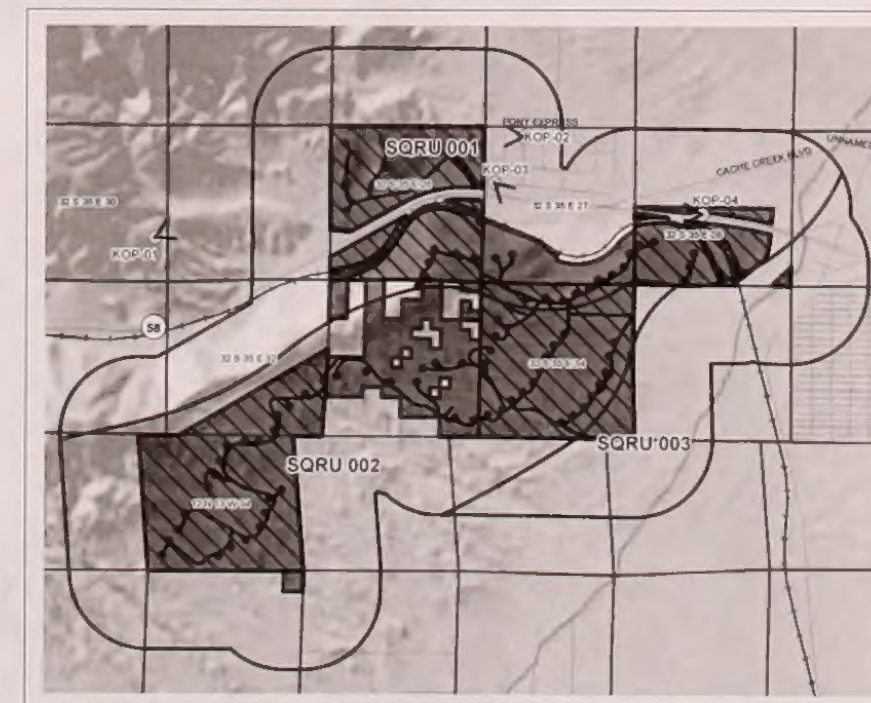
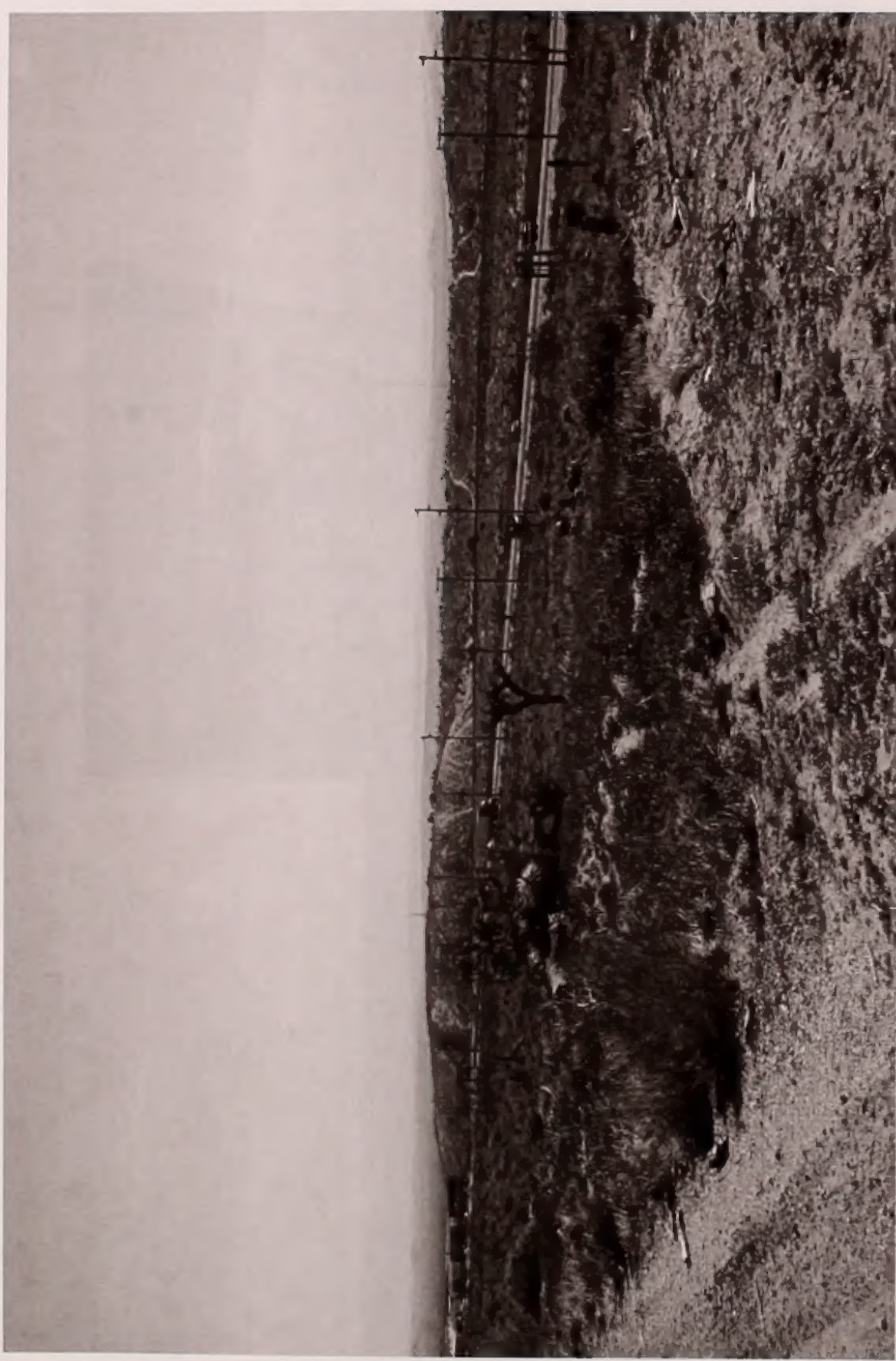
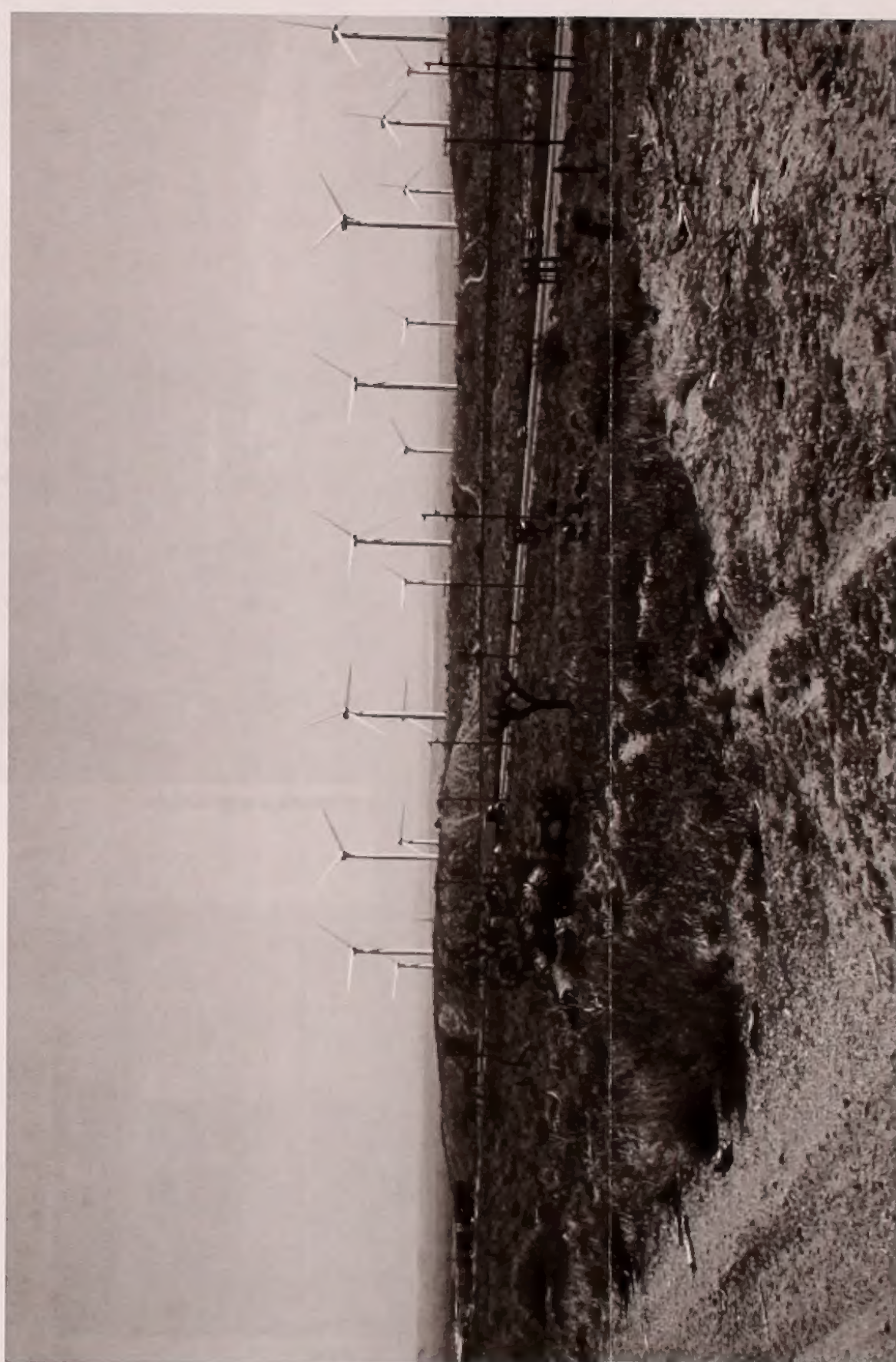


FIGURE D-2
View from KOP 2
Alta East Wind Project
Alta Wind Energy Center Project



A. Existing View from KOP 3. View to the southeast from the rural residential area located near the eastern entrance to the Tehachapi Pass. This viewpoint is located along the southwestern edge of the residential area. Both SR 58 and the Southern Pacific railroad tracks are visible in the foreground and middleground. Portions of the project site visible from this location include private lands and lands managed by BLM.



B. View from KOP 3 with simulated Project. Alta East turbines would appear above the foothills south of SR 58.

FIGURE D-3
View from KOP 3
Alta East Wind Project
Alta Wind Energy Center Project



C. Panoramic existing view from KOP 3. Additional structures within the viewshed are visible.



D. Location of single-frame image used for simulation within panoramic view.

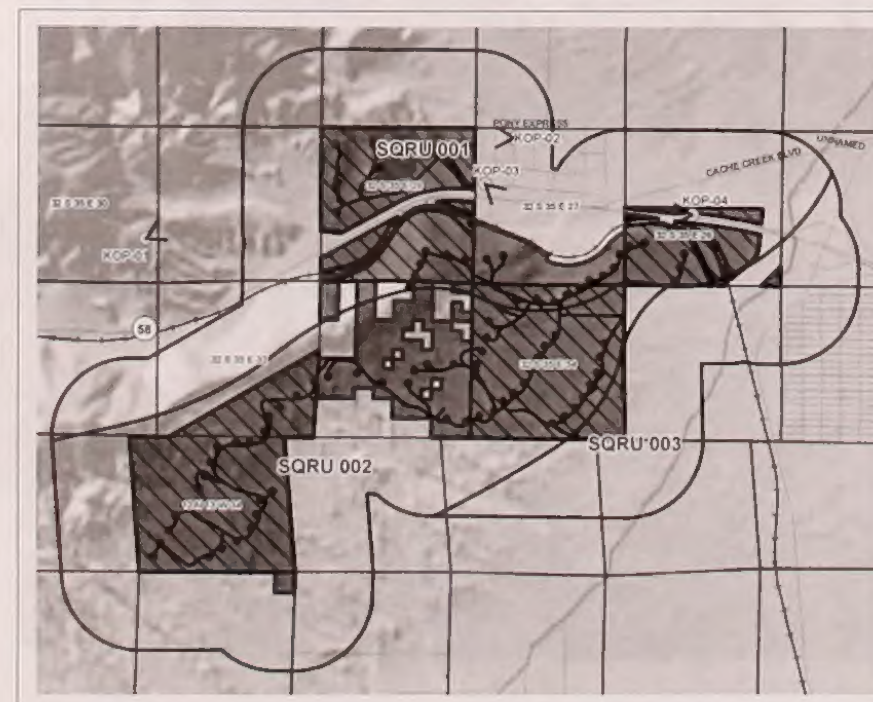
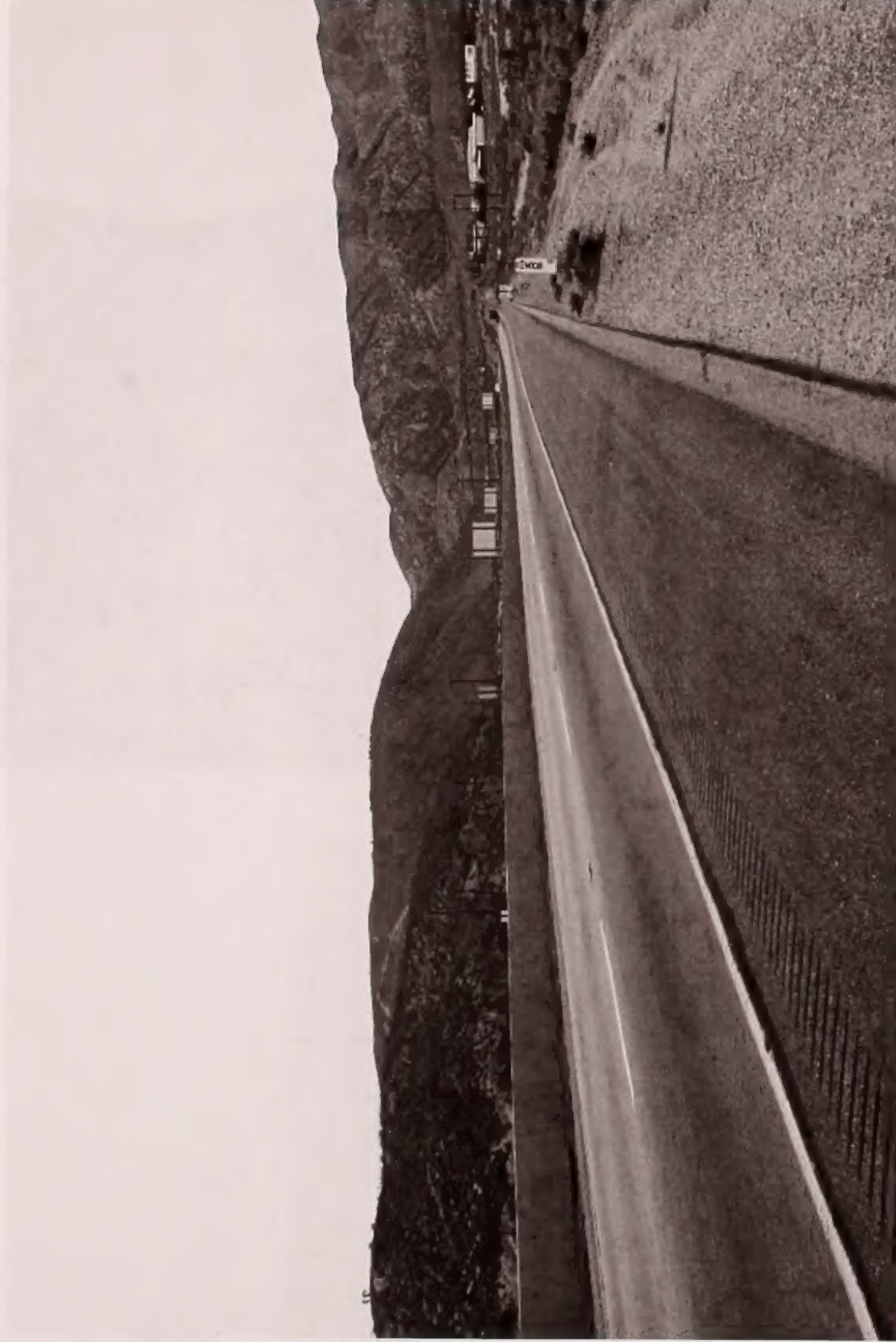
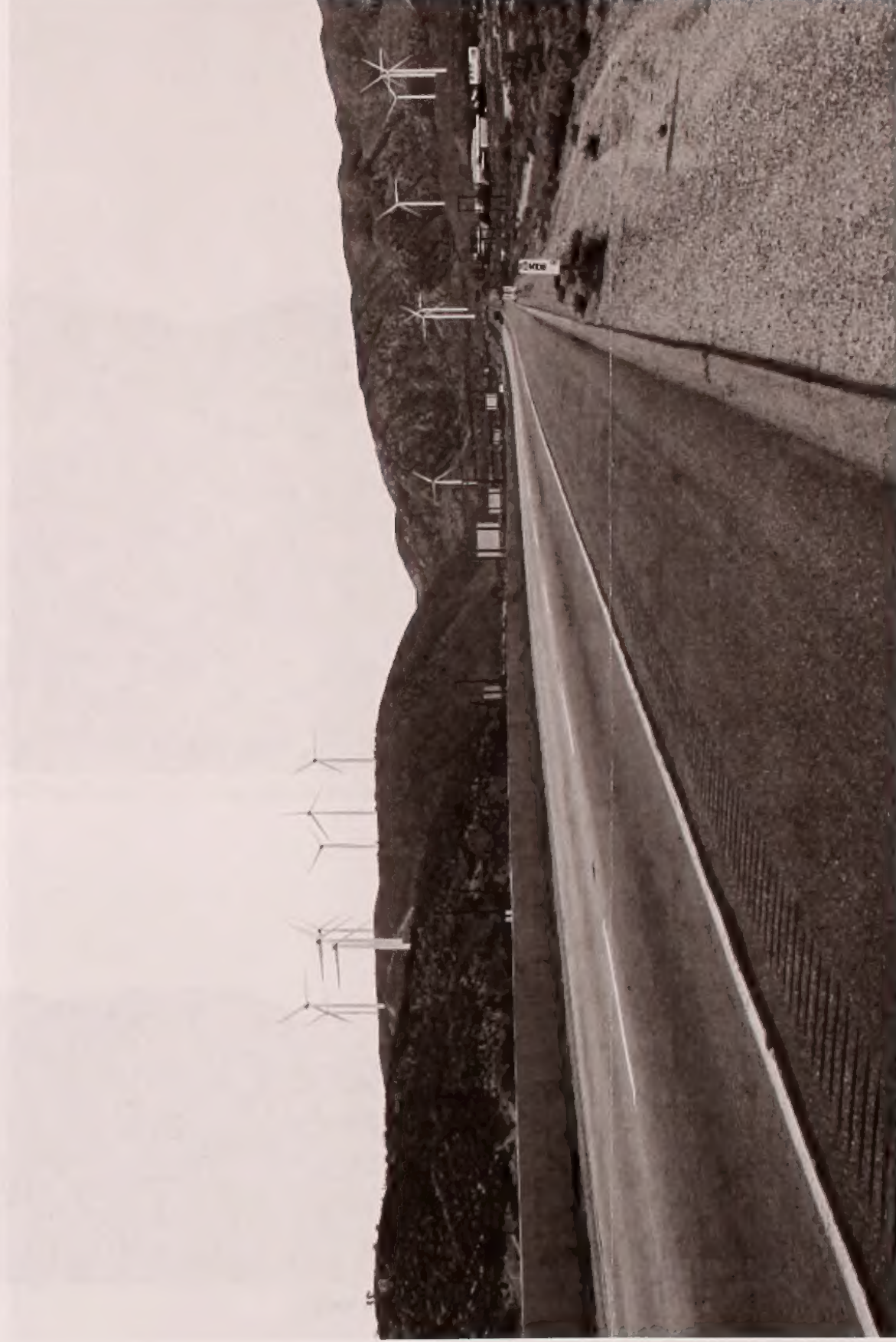


FIGURE D-3
View from KOP 3
Alta East Wind Project
Alta Wind Energy Center Project



A. Existing View from KOP 4. View to the west from the westbound lane of SR 58, east of Randsburg Cutoff Road. This view is toward the eastern entrance to the Tehachapi Pass, and the southern portion of the rural residential area is visible along the highway in the middleground. Portions of the project site visible from this location include private lands and lands managed by BLM.



B. View from KOP 4 with simulated Project. The Alta East Project would be visible across the view, on both sides of the highway.

FIGURE D-4
 View from KOP 4
 Alta East Wind Project
 Alta Wind Energy Center Project



C. Panoramic existing view from KOP 4. This is a wider view of the eastern entrance to the Tehachapi Pass.



D. Location of single-frame image used for simulation within panoramic view.

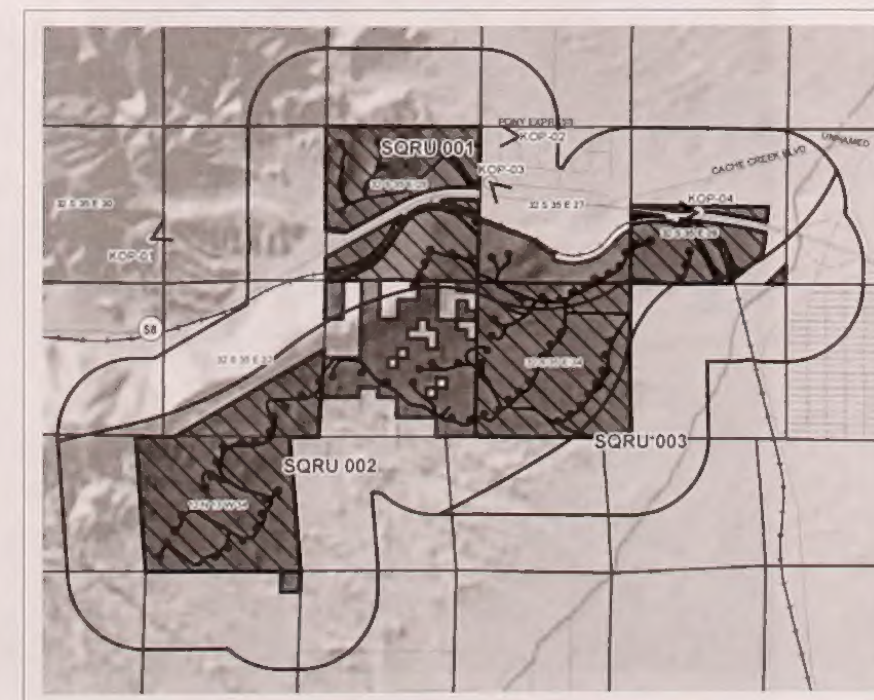


FIGURE D-4
View from KOP 4
Alta East Wind Project
Alta Wind Energy Center Project



A. Existing View from KOP 5. View to the west from Midland Trail at Sequoia Boulevard. This view approximates the view toward the northeastern portion of the project site from the intersection of SR 14 and SR 58; segments of each to the north and east of the intersection respectively are eligible for designation as state scenic highways. Portions of the project site visible from this location include private lands and lands managed by BLM.



B. View from KOP 5 with simulated Project. Alta East turbines would be visible across most of the view, along the base of the Tehachapi Mountain foothills.

FIGURE D-5
View from KOP 5
Alta East Wind Project
Alta Wind Energy Center Project



A. Existing View from KOP 6. View to the northwest from Mojave West Park in Mojave. This view approximates the view toward the southeast portion of the project site from west Mojave, which also includes two residential neighborhoods, a church, and a number of schools. Portions of the project site visible from this location include private lands and lands managed by BLM.



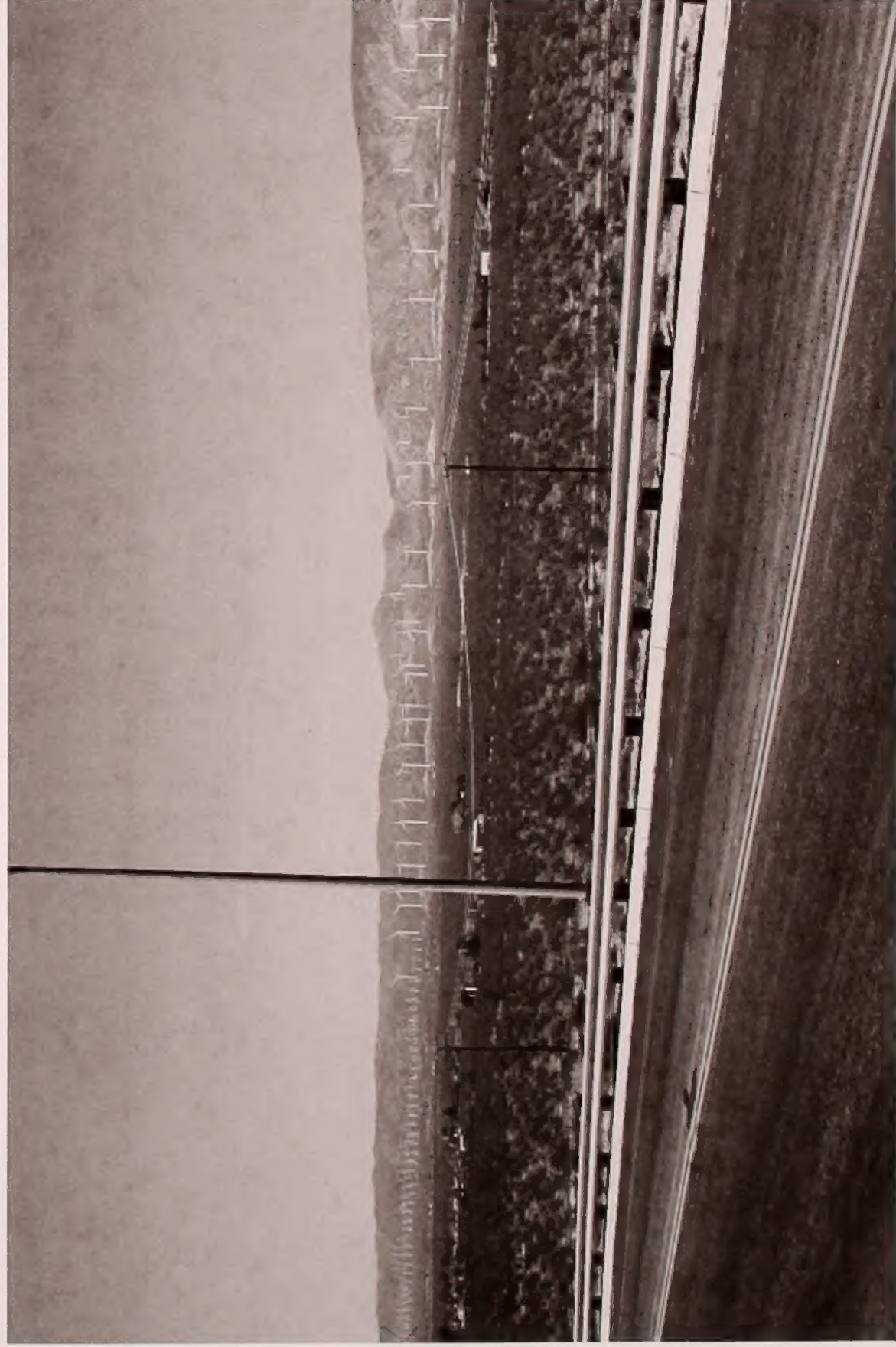
B. View from KOP 6 with simulated Project. Alta East turbines would be visible across the middle ground of this view.

FIGURE D-6

View from KOP 6
Alta East Wind Project
Alta Wind Energy Center Project



A. Existing View from KOP 7. View to the northwest from the Oak Creek Road overpass of the SR 58 business route. This elevated view approximates views from west Mojave. Existing wind turbines are visible in the foothills to the west. Portions of the project site visible from this location include private lands and lands managed by BLM.



B. View from KOP 7 with simulated Project. Alta East turbines would appear across most of the view and would be visibly taller than some of the existing turbines in the area.

FIGURE D-7
View from KOP 7
Alta East Wind Project
Alta Wind Energy Center Project

Appendix E

Visual Contrast Rating Worksheets

Visual Contrast Rating / Notes

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: 2011 July 6
District: CA DESERT
Resource Area: VISUAL
Activity (program):

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST WIND	4. Location Township 32 S Range 35 E Section 30	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 1		
3. VRM Class III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	FLAT VALLEY FLOOR VISIBLE BEYOND CLEARLY DEFINED RIDGELINES	RELATIVELY SHORT/LOW, DEFINED IN FOREGROUND	VISIBLE IN VALLEY FLOOR, BUT INDISTINCT; FEW
LINE	DIAGONAL / RUGGED SLOPES CONVERGE AT VALLEY FLOOR	RUGGED, IRRREGULARLY DISPERSED	SOMEWHAT CONTINUOUS ALONG VALLEY FLOOR
COLOR	GREENS (TGS), EARTHTONES (SOILS, DISTANT VALLEY)	GREEN / BROWN	DULL, NOT VIVID.
TEXTURE	COARSE, SPARSE	ROUGH, PATCHY	SCATTERED W/IN VALLEY FLOOR

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	TURBINES STOP RIDGELINE SOUTH OF HIGHWAY. NORTH OF HIGHWAY, TURBINES OBSTRUCT FROM LAND	NOT SUBSTANTIALLY AFFECTED.	TURBINES NEW? MOST VISIBLE STRUCTURES
LINE	TURBINES PARTIALLY DISRUPT LINES NORTH OF SR 58	NOT SUBSTANTIALLY AFFECTED	TURBINES OBSCURE SLIGHTLY THE VALLEY FLOOR, AND ARE NOT ARRANGED LINEARLY.
COLOR	NO SUBSTANTIAL DIFFERENCE; COLORS IN DISTANT VALLEY PARTIALLY OBSERVED.	NOT SUBSTANTIALLY AFFECTED	ADD ELEMENT OF WHITE TO VIEW.
TEXTURE	TURBINES ADD A TEXTURAL ELEMENT TO LANDSCAPE; LITTLE CHANGE TO EXISTING	NOT SUBSTANTIALLY AFFECTED.	TURBINES ADD A TEXTURAL ELEMENT TO LANDSCAPE.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	
	LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
ELEMENTS	Form			X						X				3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS Evaluator's Names: Josh Homan Date: 6 July 2011
	Line		X				X			X				
	Color			X			X			X				
	Texture			X			X			X				

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST	4. Location Township 32 S Range 35 E Section 30	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point		
3. VRM Class III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	ROLLING HILLS TO FLAT DESERT TERRAIN	GEOMETRIC & ROUNDED (FOREGROUND/MID B)	LINEAR; SOME GEOMETRIC IN BACKGROUND
LINE	HORIZONTALS & DIAGONALS	DIAGONALS & VERTICALS	HORIZONTAL = ROAD; TRANSMISSION TOWERS = VERTI- CAL
COLOR	BROWNS/TANS/ FEW GREYS	GREENS/BROWNS/ GREYS	BROWNS/TANS/GREYS & BLACK
TEXTURE	SOFTER TOPOGRAPHY BUT DRAINAGES ADD TEXT.	FOREGROUND VEG = HIGH TEXTURE	HIGHWAY & SCATTERED STRUCTURES ADD TEXTURE

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	ROLLING HILL REMAINS INTACT	REMAINS INTACT - MINIMAL REMOVAL	DISTRACTS FROM FORM AGAINST SKY LINE
LINE	PARTIALLY OBSCURED BY NEW STRUCTURES	LESS REMARKABLE - DISTRACTED BY TURBINES	INTRODUCES VERTICAL LINES
COLOR	NEW COLOR INTRODUCED BY ROADS	MINIMAL REMOVAL	INTRODUCES WHITE
TEXTURE	REMAINS SIMILAR	REMAINS SIMILAR - DISTRACTED BY TURBINES	GIVES HIGHER TEXTURE & DETRACTS FROM EXISTING

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) - SEE ANALYSIS	3. Additional mitigating measures recommended ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None			
ELEMENTS	Form			X				X		X					Evaluator's Names CORINNE WYLE BONINE	Date 7.5.2011
Line		X					X		X							
Color		X					X		X							
Texture			X				X			X						

MODERATE

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 2011 JULY 6
District CA DEERT
Resource Area VISUAL
Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name <u>ALTA EAST WIND</u>	4. Location Township <u>32 S</u> Range <u>35 E</u> Section <u>27</u>	5. Location Sketch <u>SEE FIGURE ATTACHED TO REPORT</u>
2. Key Observation Point <u>2</u>		
3. VRM Class <u>III</u>		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	MOUNTAINS ARE PROMINENT, BUT BACKED UP TO MOSTLY RUGGED FOREGROUND.	RELATIVELY DIVERSE, RANGING FROM LINEAR TO DOME	CLEARLY DEFINED RESIDENCES & ASSOCIATED STRUCTURES, MOSTLY LOW
LINE	ANGULAR RIDGELINES, MOSTLY CONTINUOUS WITHIN VIEW	IRREGULAR	ARRANGED IN STRAIGHT LINE ACROSS VIEW
COLOR	HARMONIOUS SHADES VISIBLE WITHIN MOUNTAIN SLOPES, VALLEY FLOOR	GREEN, YELLOW BROWN, GRAY	MOSTLY SUBTLE, RELATIVE TO LANDSCAPE, W/ EXCEPTION OF WATER TOWERS
TEXTURE	PATCHY IN FOREGROUND, COARSER AND DOTTED ON SLOPES	ROUGH & PATCHY, DOTTED ALONG SLOPES	MOSTLY SUBTLE, MOORED

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	LOWER RIDGELINES MORE EASILY IDENTIFIED WITH TURBINES	NO SUBSTANTIAL DIFFERENCE.	TURBINES BECOME DOMINANT STRUCTURES; WOULD APPEAR ABOVE RIDGELINE
LINE	LOWER RIDGELINES DISTURBED BY PRESENCE OF TURBINES	NO SUBSTANTIAL DIFFERENCE	LINEAR STRUCTURES WOULD SKYLINE ABOVE RIDGELINE.
COLOR	NO SUBSTANTIAL DIFFERENCE	NO SUBSTANTIAL DIFFERENCE	TURBINES ADD WHITE FEATURES TO VIEW.
TEXTURE	SOME DISTANT TEXTURE OBSERVED	NO SUBSTANTIAL DIFFERENCE; SOME HILLTOP VEG OBSERVED	STRONG VERTICAL TEXTURE ADDED.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u>		
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None			
ELEMENTS	Form			X												
	Line		X							X						
	Color			X						X						
	Texture			X						X						
Evaluator's Names <u>Josh Horn</u>														Date <u>6 JULY 2011</u>		

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES.

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST	4. Location Township 32 S Range 35 E Section 27	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 2		
3. VRM Class III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	RUGGED MOUNTAINS IN MIDDLE GROUND	GEOMETRIC	CYLINDRICAL/ BOXES/VERTICAL
LINE	HORIZONTAL & DIAGONAL AGAINST SKY/HIGHER MTS.	VERTICAL & DIAGONAL	VERTICAL = BUILDING WALLS; HORIZONTAL = ROOFS
COLOR	LIGHT TANS / DARKER BROWNS / GREYS	GREENS / BROWNS / GREYS	WHITES / CREAMS, BROWNS & TANS
TEXTURE	DRAINAGES & EXPOSED ROCKS ADD TEXTURE	JOSHUA TREES & SHRUBS ADD TEXTURE	STRUCTURES ADD TEXTURE

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	FORM REMAINS MAINLY UNCHANGED / UNOBSERVED	REMAINS LARGELY UNCHANGED	INTRODUCES NEW FORM TO KOP
LINE	PREDOMINANTLY HORIZONTAL	LESS NOTICEABLE	MAKES VERTICAL LINES THE DOMINANT FEATURE
COLOR	TURBINES MAKE COLOR APPEAR DARKER	CONTRAST INCREASES	ADDITION OF BRIGHT WHITE
TEXTURE	OBSTRUCT LESS INTERESTING TEXTURE	TURBINES DRAW ATTENTION FROM VEG TEXTURE	INCREASED TEXTURE FROM TURBINES

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
													3. Additional mitigating measures recommended ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS
EVALUATOR'S NAMES CORINNE LITTLEBONINE													DATE 7.5.2011

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 2011 JULY 6
District CA DESERT
Resource Area VISUAL
Activity (program)

SECTION A. PROJECT INFORMATION

1 Project Name <u>ALTA EAST WIND</u>	4 Location Township <u>32 S</u> Range <u>25 E</u> Section <u>27</u>	5 Location Sketch <u>SEE FIGURE ATTACHED TO REPORT</u>
2 Key Observation Point <u>3</u>		
3 VRM Class <u>III</u>		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1 LANDWATER	2 VEGETATION	3 STRUCTURES
FORM	MOSTLY FLAT, WITH ROLLING HILL VISIBLE AT VALLEY FLOOR	GEOMETRIC, MOSTLY LOW	DEFINED: LINEAR (ROAD, R/X, T-LINE)
LINE	HILL ADDS UNDOULATING LINE ACROSS VIEW	BROKEN, ANGULAR	MOSTLY STRAIGHT; TRANSMISSION POLES PERPENDICULAR TO ROAD, R/X
COLOR	BROWNS PTANS	GREEN, BROWN	GRAY, BROWN
TEXTURE	DIRECTIONAL - FLATTENING AT IN DISTANCE	PATCHY, SCATTERED	ORDERED

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1 LANDWATER	2 VEGETATION	3 STRUCTURES
FORM	MINOR LOGELINE MORE APPARENT W/ TURBINES AS BACK DROP	NO SUBSTANTIAL DIFFERENCE.	TURBINES EMPHASIZE/RELATE TO EXISTING VERTICAL STRUCTURES; HIGHLIGHT BEST
LINE	NO SUBSTANTIAL DIFFERENCE	NO SUBSTANTIAL DIFFERENCE.	STRONG VERTICAL LINEAR ELEMENTS CONTRAST WITH EXISTING LINEAR FEATURES.
COLOR	NO SUBSTANTIAL DIFFERENCE	NO SUBSTANTIAL DIFFERENCE.	STRONG WHITE FEATURES ADDED TO VIEW.
TEXTURE	TURBINES EMPHASIZE BORDER BETWEEN TWO DIFFERENT TEXTURAL AREAS	NO SUBSTANTIAL DIFFERENCE.	TURBINES ADD TEXTURAL ELEMENT, ORDERED APPEARANCE MAINTAINED.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u>			
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
ELEMENTS	Form			X				X				X					3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u>
	Line			X				X				X					
	Color			X				X				X					
	Texture			X				X				X					
Evaluator's Names <u>John Hawn</u>														Date <u>6 July 2011</u>			

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES.

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST	4. Location Township 32 S Range 35 E Section 27	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 3		
3. VRM Class III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	UNIFORM; POCKETS OF TOPOGRAPHY	UNIFORM VEGETATION HIDES FORM; GEOMETRIC	VERTICAL & HORIZONTAL
LINE	HORIZONTAL	VEG. REMOVAL CREATES LINES	PREDOMINANTLY LINEAR
COLOR	BROWNS/TANS/GREYS	GREENS & BROWNS	GREYS/LIGHTER TANS
TEXTURE	MINIMAL TEXTURE	JOSHUA TREES IN FOREGROUND ADD TEXTURE	SPECIFICITY T-LINES PROVIDE TEXTURE AGAINST SKYLINE & LANDFORM

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	FORM HIGHLIGHTED BY TURBINES	REMAINS UNCHANGED	TURBINES AGAINST SKY INTRODUCE MORE LINEAR FORMS
LINE	HORIZONTAL LINE REMAINS DOMINANT	VERTICAL LINES LESS NOTICEABLE	TURBINES EXAGGERATE VERTICAL LINES
COLOR	REMAINS LARGELY UNCHANGED	MINIMAL CHANGES	INTRODUCES WHITE
TEXTURE	RELATIVELY UNIFORM TEXTURE REMAINS	TEXTURE OF VEG OBSTRUCTED BY TURBINES	INCREASED TEXTURE

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
	Form			X					X	X			
Line			X		X					X			
Color			X			X		X					
Texture			X		X			X					
EVALUATOR'S NAMES													DATE
CORINNE WILE BONINE													7.5.2011

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VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST	4. Location Township 32 S Range 35 E Section 26	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 4		
3. VRM Class III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	ROLLING MOUNTAINS AGAINST SKY	PROVIDES GEOMETRIC & VERTICAL FORMS	LINEAR = HIGHWAY
LINE	HORIZONTAL & DIAGONAL	JOSHUA TREES	HORIZONTAL LINE DOMINATE FOREGROUND
COLOR	BROWNS & TANS & GREYS	GREENS/TANS/ BROWNS	GREY, WHITE, BROWN, BLACKS
TEXTURE	TOPOGRAPHY & DRAINAGES ADD TEXTURE	ADDS TEXTURE TO LANDFORM	HIGHWAY PROVIDES SMOOTH TEXTURAL CONTRAST

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	TURBINES HIGHLIGHT FORM OF MOUNTAINS	REMAINS LARGELY UNCHANGED	ADDS NEW LINEAR & MOVING COMPONENT
LINE	LINE IN LANDFORM OBSERVED BY TURBINES	PARTIALLY DOMINATED BY INTRODUCED TURBINES	ADD VERTICAL ELEMENT
COLOR	REMAINS LARGELY UNCHANGED	REMAINS LARGELY UNCHANGED	INCREASE WHITE PRESENT
TEXTURE	TURBINES OBSCURE LANDFORM TEXTURE	REMAINS LARGELY UNCHANGED	INCREASES TEXTURE

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Evaluator's Names	
													Date	
													CORINNE LYUE BONINE 7.5.2011	

ELEMENTS	Form			X				X			X	
	Line		X				X		X			
	Color			X			X		X			
	Texture		X				X		X			

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 2011 July 6
District CA DESERT
Resource Area VISUAL
Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name <u>ALTA EAST WIND</u>	4. Location Township <u>32 S</u> Range <u>34 E</u> Section <u>31</u>	5. Location Sketch <u>SEE FIGURE ATTACHED TO REPORT</u>
2. Key Observation Point <u>5</u>		
3. VRM Class <u>IV</u>		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	CONTRAST BETWEEN DESERT FLOOR: MOUNTAINS	ROUGH IN IMMEDIATE VIEW, MOSTLY FLAT THROUGHOUT LANDSCAPE	NARROW, TALL TURBINES VISIBLE AMONG HILLS. ROAD CLEARLY DEFINED.
LINE	STRAIGHT LINE ACROSS HORIZON AT VALLEY FLOOR; GOUGE; ANGULAR CLOBELINE	DISPERSED	TURBINES APPEAR CLUSTERED, NON-LINEAR. ROAD IS MOSTLY STRAIGHT
COLOR	HARMONIOUS EARTH TONES	MAINLY GREEN	WHITE STRUCTURES APPARENT AGAINST SKY/DROP. ROAD IS DIRT
TEXTURE	CONTRASTING FLAT FOREGROUND WITH ARTICULATED HILLSIDES	COARSE, RELATIVELY DENSE	SCATTERED TURBINES, MEDIUM TEXTURE DIRT ROAD.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	SUBSTANTIAL PORTION OF HILLSIDE FORM OBSCURED.	NO SUBSTANTIAL DIFFERENCE.	NEW TURBINES RELATE TO, BUT ALSO MAKE SUBORDINATE, EXISTING TURBINES.
LINE	LINE BETWEEN VALLEY AND HILLSIDES REMAINS	NO SUBSTANTIAL DIFFERENCE.	VERTICAL STRUCTURES APPEAR AS BROAD BAND ACROSS FOOTHILLS
COLOR	NO SUBSTANTIAL DIFFERENCE.	NO SUBSTANTIAL DIFFERENCE.	NOTICEABLE ADDITION OF WHITE TO VIEW
TEXTURE	SUBSTANTIAL PORTION OF HILLSIDE FORM OBSCURED.	NO SUBSTANTIAL DIFFERENCE.	TURBINES ALTER TEXTURE VISIBLE WITHIN FOOTHILLS

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u>			
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
ELEMENTS	Form		X					X				X					3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u> Evaluator's Names <u>JOHN HOAN</u> Date <u>6 JULY 2011</u>
	Line			X				X			X						
	Color			X				X			X						
	Texture		X					X			X						

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES.

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALT4 EAST	4. Location Township 22S Range 35E Section 31	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 5		
3. VRM Class IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	JAGGED MOUNTAINS AGAINST SKYLINE	RELATIVELY FORMLESS-COVER GROUND	LINEAR: GRADED DIRT ROAD & MOVING
LINE	HORIZONTAL DESERT FLOOR & HORIZ/DIG AGAINST SKY	LACK OF VEG ON ROADS CREATE LINES	HORIZONTAL & VERTICAL (TURBINES)
COLOR	BROWNS, TANS, GREYS	BROWNS, GREENS, TANS	LIGHTER TAN & WHITE
TEXTURE	DRAINAGES & TOPO ADD TEXTURE	SPACED CREOSOTE ADDS TEXTURE	SMOOTH FROM LACK OF VEGETATION; TURBINES =

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	OBSCURED BY NUMEROUS TURBINES	REMAINS LARGELY UNCHANGED	LINEAR & MOVING COMPONENT BECOMES DOMINANT
LINE	HORIZONTAL DESERT FLOOR REMAINS; RIDGELINE OBSCURED	LINE FROM LACK OF VEG LETS DOMINANT	HORIZONTAL CONTINUES TO DOMINATE FOREGROUND BUT VERTICAL MIDDLE & BACKGROUND
COLOR	REMAINS LARGELY UNCHANGED	REMAINS LARGELY UNCHANGED	WHITE DOMINATES MIDDLEGROUND VIEWS
TEXTURE	DRAINAGES & TOPO SOMEWHAT OBSCURED	TEXTURE FROM VEG LESS DOMINANT	ADDED TEXTURE - VERTICAL TURBINES & MOVING PARTS

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

I. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	3. Additional mitigating measures recommended ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
	Form			X				X		X				
Line		X					X		X					
Color			X				X		X					
Texture		X					X		X					

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 2011 July 6
District CA Desert
Resource Area VISUAL
Activity (program)

SECTION A. PROJECT INFORMATION

1 Project Name ALTA EAST WIND	4 Location Township 11 N Range 12 W Section 7	5 Location Sketch SEE FIGURE ATTACHED TO REPORT
2 Key Observation Point 6		
3 VRM Class IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1 LANDWATER	2 VEGETATION	3 STRUCTURES
FORM	LUGGED MOUNTAINS BREAKING TO SLIGHTLY UNULATING FOREGROUND	RELATIVELY DIVERSE; GEOMETRIC	TALL, THIN TOWERS
LINE	PARTIALLY APPARENT EDGE OF VALLEY FLOOR; DEFINITE RIDGELINE	DISPERSED	TURBINES APPEAR IN ROW WITH HILLSIDE
COLOR	HARMONIOUS COLORS IN HILLSIDES; BATHING DESERT FLOOR	BRIGHT, YELLOWS, GREENS, BROWNS	WHITE
TEXTURE	CONTRAST BETWEEN MOUNTAINS & DESERT FLOOR	COARSE, PATCHY	UNIFORM

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1 LANDWATER	2 VEGETATION	3 STRUCTURES
FORM	TURBINES PARTIALLY OBLURE FOOTHILLS ACROSS VIEW	NO SUBSTANTIAL DIFFERENCE.	NEW TURBINES RELATE TO AND RENDER SUBORDINATE, EXISTING TURBINES
LINE	VALLEY/HILLSIDE BOUNDARY BLURRED; RIDGELINE INTACT	NO SUBSTANTIAL DIFFERENCE.	NEW TURBINES APPEAR AS WIDE BAND ACROSS VIEW
COLOR	NO SUBSTANTIAL DIFFERENCE.	NO SUBSTANTIAL DIFFERENCE.	WHITE BAND OF STRUCTURES VISIBLE ACROSS VIEW.
TEXTURE	TURBINES PARTIALLY OBLURE FOOTHILLS ACROSS VIEW	NO SUBSTANTIAL DIFFERENCE.	NEW TURBINES EXTEND UNIFORM ~~SPACES~~ ACROSS VIEW TEXTURE

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS		3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
		Form	Line	Color	Texture	Form	Line	Color	Texture	Form	Line	Color	Texture				
ELEMENTS	Form		X					X			X			EVALUATOR'S NAMES JOHN HORN	DATE 6 JULY 2011		
	Line			X				X		X							
	Color			X				X		X							
	Texture		X					X		X							

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES.

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST	4. Location Township 11N Range 12W Section 7	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 6		
3. VRM Class IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	ROLLING FOOTHILLS AGAINST SKY;	FOREGROUND VEG. CONTRIBUTES IRREGULAR SHAPES	LINEAR & MOVING
LINE	DESERT FLOOR MAKES HORIZONTAL LINE	VEG. HIGHLIGHTS HORIZ. LINE BETWEEN DESERT FLOOR & FOOTHILLS	VERTICAL & SOME HORIZ/DIAGONAL (ROADS)
COLOR	BROWNS, TANS, GREYS	GREEN, BROWN, YELLOW	WHITE & TANS
TEXTURE	DRAINAGES & TOPO ADD TEXTURE	DIVERSE VEGETATION ADDS TEXTURE	MOVEMENT IN PARTICULAR ADDS TEXTURE

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	LANDFORM REMAINS DOMINANT	REMAINS LARGELY UNCHANGED - DOMINATES FOREGROUND	MOVEMENT & LINEAR COMPONENT BECOMES DOMINANT
LINE	LINE REMAINS DOMINANT	LINE MINORLY OBSCURED	VERTICAL TURBINES BECOME DOMINANT
COLOR	LARGELY UNCHANGED	LARGELY UNCHANGED	INCREASED WHITE
TEXTURE	TEXTURE SLIGHTLY OBSCURED	FOREGROUND REMAINS DOMINATED BY VEG. TEXTURE	ADDED TEXTURE

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)			
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
ELEMENTS	Form			X				X				X					3. Additional mitigating measures recommended ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS
	Line			X				X				X					
	Color			X				X				X					
	Texture			X				X				X					
														Evaluator's Names		Date	
														CORINNE LYLE BONINE		7.5.2011	

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 2011 July 6
District CA Desert
Resource Area VISUAL
Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name <u>ALTA EAST WIND</u>	4. Location Township <u>11 N</u> Range <u>12 W</u> Section <u>8</u>	5. Location Sketch <u>SEE FIGURE ATTACHED TO REPORT</u>
2. Key Observation Point <u>7</u>		
3. VHM Class <u>IV</u>		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	CONTRASTING VALLEY FLOOR WITH HILLS/MOUNTAINS... FLAT TO RUGGED	COARSE DESERT VEGETATION EVIDENT ACROSS VALLEY FLOOR	TALL, THIN POLES = TURBINES VISIBLE THROUGHOUT; ROAD IS PROMINENT, OTHER STRUCTURES VARY
LINE	RIDGELINE IS CONTINUOUS	DISPERSED	ROAD FORMS BOLD LINE. TRANSMISSION LINE'S LINEAR RATE IS APPARENT.
COLOR	LANDSCAPE MORE MONOTONE FROM THIS DISTANCE	MOSTLY GREEN	WHITE TURBINES, VARIED BUILDINGS; POLES = ROAD GRAY/BROWN
TEXTURE	CONTRAST BETWEEN RELATIVELY SMOOTH VALLEY FLOOR AND RUGH MOUNTAIN SLOPES	ROUGH	DISCONTINUOUS

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	CONTRAST REMAINS; EDGE BETWEEN FOOTHILLS & VALLEY FLOOR IS BLURRED A BIT	NO SUBSTANTIAL DIFFERENCE.	NEW TURBINE RELATE TO EXISTING TURBINES & OTHER VERTICAL STRUCTURES.
LINE	RIDGELINE REMAINS INTACT.	NO SUBSTANTIAL DIFFERENCE.	NEW TURBINES CONNECT EXISTING CLUSTERS TO FORM BAND OF STRUCTURES ACROSS VIEW.
COLOR	NO SUBSTANTIAL DIFFERENCE.	NO SUBSTANTIAL DIFFERENCE	WHITE BAND ACROSS VIEW
TEXTURE	CONTRAST REMAINS; EDGE BETWEEN FOOTHILLS & VALLEY FLOOR IS BLURRED A BIT	NO SUBSTANTIAL DIFFERENCE.	ADDS SOME CONSISTENCY TO OTHERWISE DISCONTINUOUS VIEW.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u>	3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side) <u>SEE ANALYSIS</u>	
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None			
ELEMENTS	Form			X				X					X			
	Line			X				X					X			
	Color			X				X					X			
	Texture			X				X					X			

Evaluator's Names Josh Horn Date 6 July 2011

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 7.5.2011

District CA DESERT

Resource Area VISUAL RES.

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name ALTA EAST	4. Location Township 11 N Range 12 W Section 8	5. Location Sketch SEE FIGURE ATTACHED TO REPORT
2. Key Observation Point 7		
3. VRM Class IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	ROLLING FOOTHILLS AGAINST SKY	RELATIVELY FORM-LESS DUE TO DISTANCE FROM KOP	BOXY STRUCTURES IN M/G; LINEAR IN FG & BG
LINE	PREDOMINANTLY HORIZONTAL	ABSENCE FROM FOOT HILLS PROVIDES HORIZ. LINE	VERTICAL: T-LINES/POLES, TURBINES HORIZONTAL: ROAD
COLOR	BROWNS, TANS, GREYS	BROWNS & GREENS	METAL, GREY, YELLOW, BROWNS/TANS, WHITE
TEXTURE	TEXTURE LOST DUE TO DISTANCE FROM LANDFORM	SPACING BETWEEN VEG PROVIDES TEXTURE IN FOREGROUND	TURBINES ADD TEXTURE

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	RENTAINS DOMINANT	REMAINS LARGELY UNCHANGED	LINEAR & MOVING COMPO. DOMINATES MIDDLEGROUND
LINE	HORIZONTAL LINES REMAIN	REMAINS LARGELY UNCHANGED	ADDS DOMINANCE FOR VERTICAL LINES
COLOR	REMAINS LARGELY UNCHANGED	REMAINS UNCHANGED	ADDED WHITE
TEXTURE	TEXTURE OBSCURED BY TURBINES	REMAINS UNCHANGED	ADDED STRUCTURAL TEXTURE

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS	
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form			X				X				X			3. Additional mitigating measures recommended ☒ Yes ☐ No (Explain on reverse side) SEE ANALYSIS
Line			X				X				X			
Color		X	X				X				X			
Texture		X	X				X				X			
EVALUATOR'S NAMES													Date	
CORINNE LYLE BONINE													7.5.2011	

MODERATE/WEAK

Appendix E.2

Shadow Flicker Report

Shadow Flicker Analysis for the Alta East Wind Project

Prepared for
Alta Windpower Development, LLC

May 2011

Prepared by
CH2MHILL

Contents AND Abbreviations

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Acronyms and Abbreviations

AFB	Air Force Base
DECC	Department of Energy & Climate Change
DEM	digital elevation model
EMD	EMD International A/S
Hz	hertz
m/s	meters per second
NRC	National Research Council
Project	proposed Alta East Wind Project
USGS	United States Geological Survey

SECTION 1

Introduction

Shadow flicker is the term used to refer to the alternating changes in light intensity that can occur at times when the rotating blades of wind turbines cast moving shadows on the ground or on structures. Shadow flicker occurs only when the wind turbines are operating during sunny conditions, and is most likely to occur early and late in the day when the sun is at a low angle in the sky. The intensity of shadow flicker is defined as “the difference or variation in brightness at a given location in the presence or absence of a shadow” (National Research Council [NRC], 2007). The intensity of the shadows cast by moving blades of wind turbines, and thus the perceived intensity of the flickering effect, is determined by the distance of the affected area from the turbine, with the most intense, distinct, and focused shadows occurring closest to the turbine (Department of Energy & Climate Change [DECC], 2009). The frequency of shadow flicker is a function of the number of blades making up the wind turbine rotor and rotor speed. Shadow flicker frequency is measured in terms of alternations per second, or Hertz (Hz).

Two kinds of concerns have been raised about shadow flicker in severe cases. One is that shadow flicker could have the potential to trigger epileptic seizures, and the other is that shadow flicker could become a source of annoyance to residents living near wind turbines. The Epilepsy Foundation notes that for a small minority (about 3 percent) of the 3 million people in the U.S. who are affected by epilepsy, there is a potential for epileptic seizures to be triggered by flashing light. These seizures have the potential to be triggered when the light flashes are in the range of 5 to 30 Hz. Because the frequency of the shadow flicker created by modern wind turbines is in the range of 0.6 to 1.0 Hz, the shadow flicker effects created by wind turbines do not have the potential to trigger epileptic seizures (Epilepsy Foundation, 2008).

The issue of annoyance is more subjective. There could be cases in which shadow flicker cast on residences located very close to wind turbines could be enough of a distraction for residents to be considered a nuisance.

Method for Predicting Shadow Flicker Effects

CH2M HILL conducted this shadow flicker analysis for the proposed Alta East Wind Project (project) with two conceptual study layouts of 101 turbines (Option A) and 103 turbines (Option B) using the SHADOW calculation module of the WindPRO software. WindPRO is a comprehensive software package developed to design, develop, and assess wind farm projects, as well as for the evaluation of energy, environmental, visual, electrical and economic effects of wind farm projects. To calculate shadow flicker levels at nearby residences, the WindPRO SHADOW calculation module takes into account the location of each residence, the orientation of each side of the residential structure, the location of each wind turbine, turbine hub height, turbine rotor width, turbine blade width, latitude and longitude, elevation data of the specific analysis area, and data on the sun's path through the sky on each day of the year (EMD International A/S [EMD], 2008). The locations of proposed wind turbines and nearby residences were provided by Alta Windpower Development, LLC. This analysis was restricted to evaluating the effects to potential residences located within 2,000 meters of the proposed turbines. The WindPRO SHADOW calculation model was run based on the assumption that the project would use Vestas V90-3.0MW turbines with a hub height of 80 meters and a rotor diameter of 90 meters.

The model domain extended 2,000 meters (1.2 miles) in each direction from the proposed wind turbine locations. The shadow flicker model made use of topographic data to account for elevation differences and topographic features in the line of sight when turbines are viewed from a residence. United States Geological Survey (USGS) seamless digital elevation model (DEM) files with 10-meter (33-foot) resolution were used to create 3-meter increment contour data.

As the sun approaches the horizon, sunshine becomes less intense and, therefore, the shadow influence is reduced. To take this phenomenon into account, the standard practice in shadow flicker analysis is to calculate shadow flicker for only the times when the sun is at an angle of 3 or more degrees above the horizon (EMD, 2008; Osten and Pahlke, 1998). In conducting this analysis, the 3-degree threshold was observed.

In addition, the model was set to calculate shadow flicker only in the areas where 20 percent or more of the sun would be covered by the blade, creating detectable levels of flickering (EMD, 2008; Osten and Pahlke, 1998). The distance threshold defining the area within which 20 percent or more of the sun is covered is determined by the WindPRO program based on the width of the rotor blades.

In this case, 1,425 meters (0.88 mile) was determined to be the maximum distance from the turbine within which shadows would fall that would entail coverage of 20 percent or more of the sun's surface. The orientation of each residence was set on "greenhouse mode" for the model, which assumes that the residence has windows on all of its sides and, therefore, would be affected by shadow flicker that falls on any side of the structure. The "greenhouse mode" represents a worst-case scenario for each residence.

Two runs of the WindPro SHADOW calculation model were conducted. The first run provided a “worst-case” assessment, and the second run, referred to as the “adjusted-case assessment,” took into account a number of factors that, under actual operating conditions, would reduce the total amounts of shadow flicker impact created.

2.1 Worst-case Assessment

The worst-case WindPRO model run assumed the following:

- Clear skies from sunrise to sunset
- Turbines would be running constantly (i.e., 8,760 hours per year)
- The rotor would always be oriented perpendicular to the residence

These assumptions generate model results that represent a substantial overestimation of the daily minutes and total annual hours of shadow flicker. The overestimation occurs because there would be times when: overcast conditions occur and shadows would not be created, the rotors would not be turning due both to wind conditions and down time for maintenance, and the rotors would not be perpendicular to the residences of concern, and would thus be incapable of casting shadows on them.

2.2 Adjusted-case Assessment

To develop a more accurate assessment of the shadow flicker effects that the project would create, the model was run a second time using available information regarding sunshine conditions in the project area, and the number of daylight hours the turbines would likely be to be spinning. The latter is based on wind conditions and the times when the turbines would be shut down for maintenance.

2.2.1 Probability of Sunshine

To adjust the model to take into account the probable hours of sunshine in the project area, cloud coverage data were needed. Because detailed meteorological data were not available for the project site itself, research was conducted to locate a nearby meteorological station that collects the required data. The research revealed that the nearest station where these data are collected is located at Edwards Air Force Base (AFB), which is located approximately 21 miles southeast of the project site.

The meteorological data set from Edwards AFB is only 30 percent complete on an annual basis. The reason for the lack of data completeness at this monitoring location is unknown, but it is not unusual for airport sites to monitor only for site-specific purposes and thus not have continuous data records. However, the Edwards AFB data set includes 5 years of observation and is the only data set available that represents the climate conditions near the project area. The second closest and more complete data set available is from the Bakersfield Airport, which is located approximately 48 miles northwest from the project area. Although located in Kern County, Bakersfield Airport is in the Central Valley, where climate conditions differ significantly from those experienced at the project area.

Using the 5 years of hourly meteorological data collected at a 10-meter tower at Edwards AFB, the monthly probabilities of sunshine were calculated. The process of calculating these

probabilities entailed using AERMET, an Environmental Protection Agency-approved meteorological data processor that has the ability to read and extract parameters from raw National Weather Service data. For this analysis, AERMET (version 06341) was used to extract the convective mixing height and fraction of cloud cover for each hour based on the station latitude and time zone. The total daytime hours were determined from the convective mixing height, which is generated only during daytime hours. For each hour, a cloud cover fraction of 0.7 and below was considered sunny. The total number of sunny hours (or sun hours) was divided by the total number of daytime hours in the month (or possible sun hours) to determine each month's sunshine probability. The monthly sunshine probabilities that were derived through this analysis and used in calculating the project's likely shadow flicker effects are summarized in Table 1.

TABLE 1

Average Sunshine Probability Per Month (Recorded Sun Hours/Possible Sun Hours) for Edwards Air Force Base, California
Alta East Wind Project

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.71	0.59	0.63	0.73	0.82	0.88	0.84	0.87	0.95	0.78	0.70	0.55

2.2.2 Predicted Turbine Operation and Rotation

To provide the adjusted-case assessment with a more accurate estimate of the numbers of hours that the turbines would be in operation, data were collected on "wind farm availability." These data identified the percentage of time that the turbines would be available to generate electricity, versus the percentage of time that they would be offline for maintenance. Data were also collected on wind availability to provide a basis for determining the percentage of time when wind speeds would be high enough to spin the blades, but low enough to allow the turbines to operate safely.

This predicted number of operational hours was calculated using the following equation, which incorporates an expected wind farm availability of 95.3 percent and a wind availability of 74.6 percent:

$$\begin{aligned} & (\text{Total hours per year}) * (\text{wind farm availability}) * (\text{wind availability}) \quad (1) \\ & = \text{predicted annual operational hours} \end{aligned}$$

Using Equation 1, the calculation yields the following number of annual operation hours:

$$(8,760 \text{ hours}) * (0.953) * (0.746) = 6,227.82 \text{ annual operational hours}$$

The equipment availability figure used includes the expected mechanical availability of the Vestas V90-3.0 MW turbine selected for the project as well as expected availability related to the balance of the plant including the electrical systems required for turbine operations. Project equipment operating guarantees, engineering analysis, and historical Vestas V90-3.0 MW turbines operating data indicate that the project turbines can be available to operate 95.3 percent of the time per year. This availability figure is used by Garrad Hassan and other Lender's Engineers for financial conclusion assumptions for projects involving the use of this specific turbine model.

The wind performance availability was calculated from 10-minute data collected from onsite meteorological towers. The 10-minute data led to the approximation of times during the day when the wind speed would be high enough to cause the turbine to operate, but below the shut-off wind speed (above which the turbine shuts off automatically to prevent damage or malfunction). For Vestas V90-3.0 MW turbines, this wind speed range is 3.5 meters per second (m/s) to 25.0 m/s. From the wind velocity patterns at the project site, the wind availability for this project was calculated to be approximately 74.6 percent.

2.2.3 Evaluation of the Adjusted-case Assessment Results

The adjusted-case assessment assumes that the sun would be unobstructed by clouds long enough to have the potential to permit shadow flicker effects to be created anywhere from 55 percent to 95 percent of the time during daylight hours on a monthly basis, averaging out to approximately 75 percent of the time when considered on an annual basis. The adjusted-case assessment also assumes that the turbines would have the potential to operate 71 percent of the time during daylight hours (6,227.82 operation hours per year, compared to the 8,760 hours assumed by the worst-case assessment). These adjustments allow the model to generate predictions of the numbers of hours of shadow flicker experienced at residences that are more accurate with respect to the actual shadow flicker conditions that would be experienced than the hours of shadow flicker predicted by the worst-case assessment. However, the results of the adjusted-case assessment still represent an overestimation (i.e., conservative estimate) of total numbers of hours of shadow flicker effect.

A key variable that was not taken into account in the adjusted-case modeling is wind direction, which determines how much of the time the blades are turned in a direction that would cast shadows on the residences being evaluated. The data required to enable this variable to be factored into the modeling was not available. If it had been, many of the estimates of hours and minutes of potential shadow flicker exposure predicted would have been noticeably lower than the numbers calculated using only the adjustments related to cloud cover, equipment availability, and wind speed.

2.2.4 Additional Factors

The following factors that could also affect the total amount of predicted shadow flicker, but were not taken into account in the adjusted-case assessment modeling because of uncertainty or unavailable data:

- Presence of haze or particulate matter in the air could reduce the intensity of light and reduce distances at which shadows can be cast.
- Shadows created by portions of the rotor closest to the hub are more intense and can be perceived at a longer distance than shadows created by blade tips. The WindPRO model treats shadows created by all parts of the blade as if they were shadows created by blade portions closest to the hub. As a result, this could overstate distances at which shadows can be seen and might also overstate shadow effects.
- Potential structures and vegetation located between residences and the turbines, which would block shadows created by the rotating turbine blades and thus prevent shadow flicker from occurring at residences.

- The model assumes that the residences are in the “greenhouse mode” in which the residence is assumed to be all windows – a worse-case scenario. Residences normally have much less window than wall space on any given side.

Thus, in reviewing and interpreting the results of the adjusted-case assessment, it is important to keep in mind that these results are also, in a sense, worst-case or upper-limit projections, and that the actual hours and minutes of shadow flicker predicted to be experienced at residences in proximity to the project are likely to be substantially lower than those the modeling results indicate.

Analysis Results

The results of the shadow flicker modeling conducted for the Option A layout are presented in Table 2, and the results of the modeling conducted for the Option B layout are presented in Table 3. Each table lists the residences located within 2,000 meters of the proposed turbines. These residences are identified with a number that corresponds to the residence locations labeled on the project area maps presented as Figures 1A and 1B. For each residence, the tables present the modeling results in terms of the following:

- The total potential shadow flicker during all daylight hours (in hours per year) based on the adjusted-case assessment that takes overcast conditions, turbine availability, and wind speeds into account.
- The predicted maximum minutes per day of shadow flicker. To be conservative, these figures reflect the worst-case assessment and, thus, do not take overcast conditions, turbine availability, or wind speed into account.
- Identification of the turbines that would contribute to shadow flicker effects at that residence.
- The distance to the nearest turbine that contributes to shadow flicker effects at the residence.
- The months during which shadow flicker occurs.

Table 4 presents a residence-by-residence comparison of the number of hours of shadow flicker likely to be experienced under Option A and Option B.

Table 5 lists the turbines proposed under Option A that would create shadow flicker effects at nearby residences and the total numbers of shadow hours that would be generated by that specific turbine. Table 6 is a similar table that itemizes to total hours of shadow flicker effects that Option B turbines would create for nearby residences.

The results of the modeling are also presented graphically on Figures 1A and 1B. The information provided on these figures includes butterfly diagrams that indicate the distribution of hours of potential shadow flicker effect around each turbine, and the locations of the residences in relationship to these shadow flicker patterns.

The modeling results indicate that, under the Option A layout, of the 51 residences located within 2,000 meters of the proposed turbines, 43 have the potential to experience shadow flicker effects, and under Option B, 43 of the 53 residences within 2,000 meters of the turbines proposed would experience these effects.

Under both scenarios, the amount of time residences would be likely to experience shadow flicker effects would be relatively low. Under Option A, review of the annual shadow flicker exposure data indicates that residences could experience anywhere from 1 minute to nearly 24 hours per year of shadow flickering, with most of the affected residences (32 out of 41, or

78 percent) experiencing less than 10 hours per year. The results for Option B are generally similar. The adjusted-case assessment figures for Option B indicate that residences could experience anywhere from 27 minutes to 39 hours of shadow flicker effect annually, with only 20 percent of the residences experiencing more than 10 hours of shadow flickering annually.

Because the adjusted-case assessment results, although taking a number of real-world factors into account, still represent an overestimate of the likely potential hours and minutes of shadow flicker effect, it is safe to assume that the levels of potential shadow flicker exposure at residences will be even lower than the results indicate.

TABLE 2
Modeled Shadow Flicker Impacts – Option A
Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)	Maximum Daily Shadow Flicker (hrs:min per day)*	Turbines Contributing to Shadow Flicker	Distance to Nearest Turbine (meters)	Months that Shadow Flicker Occurs
Residence 1	0:00	0	—	770	—
Residence 2	0:00	0	—	776	—
Residence 3	0:00	0	—	741	—
Residence 4	5:22	0:27	AE-024, AE-025, AE-108	681	Jan, Nov, Dec
Residence 5	5:08	0:25	AE-023, AE-024, AE-108, AE-110	765	Jan, May, Jul, Aug, Dec
Residence 6	5:17	0:24	AE-023, AE-024, AE-108, AE-110	775	Jan, May, Jul, Aug, Dec
Residence 7	5:12	0:29	AE-023, AE-024, AE-070, AE-108, AE-110	804	Jan, May, Jun, Jul, Nov, Dec
Residence 8	2:47	0:18	AE-070, AE-108, AE-110	838	Jan, May, Jun, Jul, Nov, Dec
Residence 9	9:15	0:20	AE-022, AE-070, AE-110	921	Jan, Feb, May, Jun, Jul, Nov, Dec
Residence 10	9:46	0:21	AE-008, AE-022, AE-070, AE-110	948	Jan, Apr, May, Jun, Jul, Aug, Nov, Dec
Residence 11	10:40	0:29	AE-008, AE-022, AE-070, AE-110	911	Jan, Apr, May, Jun, Jul, Aug, Nov, Dec
Residence 12	10:49	0:33	AE-008, AE-021, AE-022, AE-069, AE-070	809	Jan, Feb, May, Jul, Aug, Nov, Dec
Residence 13	10:22	0:30	AE-007, AE-008, AE-021, AE-022, AE-069, AE-070	820	Jan, Feb, Apr, May, Jul, Aug, Nov, Dec
Residence 14	11:15	0:27	AE-006, AE-007, AE-008, AE-021, AE-068, AE-069	643	Jan, Apr, May, Jun, Jul, Aug, Sep, Nov, Dec
Residence 15	11:30	0:25	AE-003, AE-006, AE-007, AE-008, AE-021, AE-068	605	Jan, Apr, May, Jun, Jul, Aug, Sep, Dec
Residence 16	9:02	0:26	AE-003, AE-005, AE-006, AE-007, AE-008, AE-021	561	Jan, Mar, Apr, May, Jun, Jul, Aug, Sep, Dec
Residence 17	3:58	0:23	AE-003, AE-005, AE-006, AE-007, AE-008	482	Mar, Apr, May, Jun, Jul, Aug, Sep

TABLE 2
Modeled Shadow Flicker Impacts – Option A
Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)	Maximum Daily Shadow Flicker (hrs:min per day)*	Turbines Contributing to Shadow Flicker	Distance to Nearest Turbine (meters)	Months that Shadow Flicker Occurs
Residence 18	5:54	0:25	AE-003, AE-005, AE-006, AE-007, AE-008	422	Mar, Apr, May, Jun, Jul, Aug, Sep
Residence 19	4:10	0:25	AE-003, AE-005, AE-006, AE-007	421	Mar, Apr, May, Jun, Jul, Aug, Sep
Residence 20	5:35	0:31	AE-003, AE-005, AE-006, AE-007, AE-008	403	Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 21	5:34	0:28	AE-003, AE-005, AE-006, AE-007, AE-008	499	Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 22	7:43	0:28	AE-008, AE-022, AE-070, AE-110	965	Jan, Apr, May, Jun, Jul, Aug, Dec
Residence 23	1:30	0:20	AE-008, AE-110	1,071	Apr, May, Aug, Sep
Residence 24	2:25	0:23	AE-008, AE-110	925	Apr, May, Jul, Aug, Sep
Residence 25	9:23	0:33	AE-007, AE-008, AE-110	666	Apr, May, Jun, Jul, Aug, Sep
Residence 26	4:43	0:37	AE-003, AE-005, AE-006, AE-007, AE-008	266	Feb, Mar, Apr, May, Jul, Aug, Sep, Oct
Residence 27	3:06	0:36	AE-003, AE-005, AE-006, AE-007, AE-008, AE-110	244	Feb, Mar, Apr, Jun, Aug, Sep, Oct
Residence 28	23:56	1:23	AE-003, AE-005, AE-006, AE-007, AE-008, AE-110	250	Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 29	2:44	0:42	AE-003, AE-006, AE-007, AE-008, AE-110	495	Mar, Apr, May, Aug, Sep, Oct
Residence 30	1:42	0:34	AE-007, AE-008, AE-110	618	Mar, Apr, May, Aug, Sep
Residence 31	1:02	0:26	AE-008, AE-110	807	Mar, Apr, Aug, Sep
Residence 32	0:14	0:18	AE-110	1,130	Apr, Sep
Residence 33	0:01	0:19	AE-110	1,095	Mar, Apr, Sep
Residence 34	0:20	0:19	AE-110	1,087	Mar, Sep, Oct

TABLE 2
Modeled Shadow Flicker Impacts – Option A
Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)	Maximum Daily Shadow Flicker (hrs:min per day)*	Turbines Contributing to Shadow Flicker	Distance to Nearest Turbine (meters)	Months that Shadow Flicker Occurs
Residence 35	0:29	0:21	AE-008, AE-110	973	Mar, Sep, Oct
Residence 36	0:19	0:23	AE-008, AE-110	894	Mar, Sep
Residence 37	0:22	0:26	AE-008, AE-110	797	Mar, Apr, Sep
Residence 38	0:45	0:26	AE-008, AE-110	814	Mar, Sep, Oct
Residence 39	0:24	0:28	AE-007, AE-008, AE-110	736	Mar, Apr, Sep, Oct
Residence 40	1:11	0:30	AE-007, AE-008, AE-110	722	Mar, Sep, Oct
Residence 41	1:39	0:34	AE-007, AE-008, AE-110	639	Feb, Mar, Sep, Oct
Residence 42	12:27	1:30	AE-003, AE-005, AE-006, AE-007, AE-008, AE-110	246	Feb, Mar, Apr, Aug, Sep, Oct, Nov
Residence 43	21:37	1:53	AE-003, AE-005, AE-006, AE-007, AE-008, AE-110	202	Jan, Feb, Mar, Apr, Aug, Sep, Oct, Nov
Residence 44	17:55	1:22	AE-003, AE-005, AE-006, AE-007, AE-008, AE-110	328	Jan, Feb, Mar, Sep, Oct, Nov
Residence 45	5:50	0:23	AE-044, AE-045	842	May, Jun, Jul, Aug
Residence 46	5:35	0:21	AE-044, AE-045, AE-046	858	Apr, May, Jun, Jul, Aug
Residence 47	0:00	0	—	1,678	—
Residence 48	0:00	0	—	1,960	—
Residence 49	0:00	0	—	1,411	—
Residence 50	0:00	0	—	1,679	—
Residence 51	0:00	0	—	1,836	—

* Not adjusted for overcast conditions or operational hours.

TABLE 3
Modeled Shadow Flicker Impacts – Option B
Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)	Maximum Daily Shadow Flicker (hrs:min per day) ^a	Turbines Contributing to Shadow Flicker	Distance to Nearest Turbine (meters)	Months that Shadow Flicker Occurs
Residence 1	0:00	0	—	745	—
Residence 2	0:00	0	—	763	—
Residence 3	0:00	0	—	730	—
Residence 4	3:50	0:27	T016, T017	684	Jan, Nov, Dec
Residence 5	2:01	0:16	T017, T101	775	Jan, May, Jul, Aug, Dec
Residence 6	2:19	0:17	T017, T101	787	Jan, May, Jul, Aug, Dec
Residence 7	2:30	0:17	T017, T101	818	Jan, May, Jun, Jul, Nov, Dec
Residence 8	2:37	0:18	T007, T017, T101	852	Jan, Apr, May, Jun, Jul, Sep, Nov, Dec
Residence 9	8:33	0:22	T007, T012, T101	872	Jan, Apr, May, Jun, Jul, Aug, Sep, Nov, Dec
Residence 10	6:01	0:21	T007, T012, T101	900	Jan, Mar, Apr, May, Jun, Jul, Sep, Dec
Residence 11	9:21	0:22	T003, T007, T012, T101	863	Jan, Apr, May, Jun, Jul, Aug, Sep, Nov, Dec
Residence 12	6:17	0:29	T003, T007, T011, T012, T013	763	Jan, Feb, Apr, May, Jun, Jul, Aug, Sep, Nov, Dec
Residence 13	9:41	0:29	T003, T007, T011, T012, T015	775	Jan, Feb, Apr, May, Jun, Jul, Aug, Sep, Nov, Dec
Residence 14	12:16	0:29	T001, T003, T005, T007, T008, T011, T013, T014	644	Jan, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
Residence 15	9:27	0:31	T001, T003, T005, T007, T008, T011, T014	606	Jan, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Dec
Residence 16	6:33	0:34	T001, T005, T007, T008, T011, T014	563	Jan, Mar, Apr, May, Jul, Aug, Sep, Oct, Dec
Residence 17	5:17	0:42	T001, T005, T007, T008, T014	484	Mar, Apr, May, Jun, Jul, Aug, Sep, Oct

TABLE 3
Modeled Shadow Flicker Impacts – Option B
Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)	Maximum Daily Shadow Flicker (hrs:min per day) ^a	Turbines Contributing to Shadow Flicker	Distance to Nearest Turbine (meters)	Months that Shadow Flicker Occurs
Residence 18	4:25	0:46	T001, T005, T007, T008, T014	424	Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 19	9:07	0:52	T001, T005, T007, T008, T014	400	Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 20	10:37	0:41	T001, T003, T005, T007, T008, T014	404	Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 21	7:44	0:35	T001, T003, T005, T007, T008, T014	500	Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 22	4:06	0:23	T003, T007, T101	918	Mar, Apr, May, Jun, Jul, Aug, Sep
Residence 23	1:16	0:20	T007, T101	1,043	Mar, Apr, May, Aug, Sep
Residence 24	2:46	0:23	T003, T007, T101	925	Mar, Apr, May, Jul, Aug, Sep, Oct
Residence 25	10:11	0:33	T003, T007, T101	667	Mar, Apr, May, Jun, Jul, Aug, Sep, Oct
Residence 26	17:18	0:51	T001, T003, T005, T007, T008, T014	267	Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov
Residence 27	15:55	0:55	T001, T003, T005, T007, T008, T014	245	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
Residence 28	39:00	1:22	T001, T003, T005, T007, T008, T014, T101	250	All months
Residence 29	5:42	0:42	T001, T003, T005, T007, T014, T101	496	Feb, Mar, Apr, May, Aug, Sep, Oct, Nov
Residence 30	3:13	0:34	T003, T007, T101	619	Feb, Mar, Apr, May, Aug, Sep, Oct
Residence 31	1:42	0:26	T003, T007, T101	807	Feb, Mar, Apr, Aug, Sep, Oct
Residence 32	0:29	0:18	T007, T101	1,126	Mar, Apr, Sep, Oct
Residence 33	0:27	0:19	T007, T101	1,096	Feb, Mar, Apr, Sep, Oct
Residence 34	0:52	0:19	T007, T101	1,087	Feb, Mar, Sep, Oct, Nov
Residence 35	1:13	0:23	T003, T007, T101	973	Feb, Mar, Sep, Oct, Nov

TABLE 3
Modeled Shadow Flicker Impacts – Option B
Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)	Maximum Daily Shadow Flicker (hrs:min per day) ^a	Turbines Contributing to Shadow Flicker	Distance to Nearest Turbine (meters)	Months that Shadow Flicker Occurs
Residence 36	1:00	0:24	T003, T007, T101	894	Feb, Mar, Sep, Oct, Nov
Residence 37	1:17	0:26	T003, T007, T101	797	Feb, Mar, Apr, Sep, Oct, Nov
Residence 38	1:57	0:28	T003, T007, T101	814	Jan, Feb, Mar, Sep, Oct, Nov
Residence 39	1:26	0:29	T003, T007, T101	736	Feb, Mar, Apr, Sep, Oct, Nov
Residence 40	3:10	0:32	T003, T007, T101	722	Jan, Feb, Mar, Sep, Oct, Nov
Residence 41	4:49	0:37	T003, T007, T101	639	Jan, Feb, Mar, Sep, Oct, Nov, Dec
Residence 42	13:21	1:36	T001, T003, T005, T007, T008, T014, T101	246	Jan, Feb, Mar, Apr, Aug, Sep, Oct, Nov, Dec
Residence 43	22:16	1:58	T001, T003, T005, T008, T014, T101	202	Jan, Feb, Mar, Apr, Aug, Sep, Oct, Nov, Dec
Residence 44	18:50	1:13	T001, T003, T005, T008, T014, T101	327	Jan, Feb, Mar, Sep, Oct, Nov, Dec
Residence 45	4:26	0:20	T096, T099	594	Apr, May, Jun, Jul, Aug
Residence 46	6:32	0:36	T096, T099, T100	607	Apr, May, Jun, Jul, Aug
Residence 47	0:00	0	—	1,435	—
Residence 48	0:00	0	—	1,716	—
Residence 49	0:00	0	—	1,163	—
Residence 50	0:00	0	—	1,428	—
Residence 51	0:00	0	—	1,586	—
Residence 52	0:00	0	—	1,845	—
Residence 63 ^b	0:00	0	—	1,887	—

^a Not adjusted for overcast conditions or operational hours.

^b Residences 53 through 62 were not within 2,000 meters of a proposed turbine under the Option B layout.

TABLE 4

Comparison of Predicted Shadow Flicker per Residence (Option A vs. Option B)

Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours – Option A (hrs:min per year)	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours – Option B (hrs:min per year)
Residence 1	0:00	0:00
Residence 2	0:00	0:00
Residence 3	0:00	0:00
Residence 4	5:22	3:50
Residence 5	5:08	2:01
Residence 6	5:17	2:19
Residence 7	5:12	2:30
Residence 8	2:47	2:37
Residence 9	9:15	8:33
Residence 10	9:46	6:01
Residence 11	10:40	9:21
Residence 12	10:49	6:17
Residence 13	10:22	9:41
Residence 14	11:15	12:16
Residence 15	11:30	9:27
Residence 16	9:02	6:33
Residence 17	3:58	5:17
Residence 18	5:54	4:25
Residence 19	4:10	9:07
Residence 20	5:35	10:37
Residence 21	5:34	7:44
Residence 22	7:43	4:06
Residence 23	1:30	1:16
Residence 24	2:25	2:46
Residence 25	9:23	10:11
Residence 26	4:43	17:18
Residence 27	3:06	15:55
Residence 28	23:56	39:00
Residence 29	2:44	5:42
Residence 30	1:42	3:13
Residence 31	1:02	1:42
Residence 32	0:14	0:29
Residence 33	0:01	0:27

TABLE 4

Comparison of Predicted Shadow Flicker per Residence (Option A vs. Option B)

Alta East Wind Project

Residence ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours – Option A (hrs:min per year)	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours – Option B (hrs:min per year)
Residence 34	0:20	0:52
Residence 35	0:29	1:13
Residence 36	0:19	1:00
Residence 37	0:22	1:17
Residence 38	0:45	1:57
Residence 39	0:24	1:26
Residence 40	1:11	3:10
Residence 41	1:39	4:49
Residence 42	12:27	13:21
Residence 43	21:37	22:16
Residence 44	17:55	18:50
Residence 45	5:50	4:26
Residence 46	5:35	6:32
Residence 47	0:00	0:00
Residence 48	0:00	0:00
Residence 49	0:00	0:00
Residence 50	0:00	0:00
Residence 51	0:00	0:00

Note: Residences 52 and 63 are not included in this table, as they were only within 2,000 meters of a turbine under the Option B layout.

TABLE 5
Potential Shadow Flicker per Wind Turbine – Option A
Alta East Wind Project

Turbine ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)
AE-003	4:43
AE-005	3:15
AE-006	3:04
AE-007	9:06
AE-008	20:43
AE-021	7:59
AE-022	9:14
AE-023	2:17
AE-024	6:00
AE-025	2:48
AE-044	2:33
AE-045	5:59
AE-046	2:56
AE-068	0:52
AE-069	3:01
AE-070	5:01
AE-108	1:00
AE-110	66:29
TOTAL	157:00

Note: Only the wind turbines that are predicted to potentially cause shadow flicker at potential residences are listed in this table.

TABLE 6
 Potential Shadow Flicker per Wind Turbine – Option B
Alta East Wind Project

Turbine ID	Total Potential Shadow Flicker Adjusted for Overcast Conditions & Operational Hours (hrs:min per year)
T001	9:27
T003	23:43
T005	3:29
T007	27:04
T008	5:50
T011	8:41
T012	5:04
T013	0:56
T014	3:25
T015	3:10
T016	3:33
T017	0:54
T096	4:59
T099	1:48
T100	5:19
T101	64:48
TOTAL	172:10

Note: Only the wind turbines that are predicted to potentially cause shadow flicker at potential residences are listed in this table.

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Appendix F

Noise

Figures

Appendix F

Noise



WZI INC.

**ALTA EAST
NOISE STUDY**

Mojave, California

May 2011

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- Figure 4 Impact Analysis ENM-Model Predicted Noise Levels for Winds from 315 degrees, 30 ft/s
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EXHIBITS

- Exhibit 1 Noise Data, Vestas 3.0 Wind Turbines
- Exhibit 2 Typical Source Data Construction Noise

ATTACHMENTS

- Attachment 1 Background Noise Investigation
- Attachment 2 Kern County General Plan Noise Element
- Attachment 3 Noise and Meteorological Data
- Attachment 4 Vestas 3.0 MW Wind Turbine Specification
- Attachment 5 Modeling Corrections Based on Field Data

1 INTRODUCTION

WZI Inc. (WZI) was asked by Alta Windpower Development, LLC (“Applicant” or “AWD”) to perform a noise study of the impacts related to a proposed zone change application for Alta East Wind Project (Alta East Project, or the Project) proposed in the Tehachapi region of southern California. Portions of the Project are proposed to be located on land managed by the U.S. Bureau of Land Management (BLM) and privately-owned land under the jurisdiction of Kern County.

The Project is proposed to be located on approximately 3,200 acres on the north and south sides of State Route (SR) 58 in southeastern Kern County, California, within an area of existing wind development. The Project area is approximately 3 miles northwest of the unincorporated town of Mojave and approximately 10 miles east of the City of Tehachapi. The location of the Project site is shown in **Figure 1**, “Location Map.”

The Project site includes both private and federal lands. Federal lands within the Project area are under the jurisdiction of the BLM and private lands are under the jurisdiction of Kern County. A List of Property Owners for properties on County land is included as an Attachment to AWD’s letter to the County dated February 9, 2011. This list has been revised from the October 22, 2010 County zone change application submittal. Approximately 681 acres will need to be rezoned to be consistent with the Kern County Zoning Ordinance Wind Energy (WE) Combining District (see **Figure 1**, “Location”). The proposed development is a wind energy facility with a nameplate capacity rating of approximately 300 megawatts (MW) of wind turbine generation, and includes ancillary facilities and supporting infrastructure pursuant to Chapter 16.94 of the Kern County Zoning Ordinance. Up to 120 wind turbine generators (“WTGs” or “turbines”) would be installed. Approximately 35 percent of the Project’s area (1,116 acres) and approximately 26 to 30 percent of the WTGs would be located on land managed by the County. Two options (Option A and Option B) for turbine layout on the project site have been identified. Turbines under either option fall within the proposed WE zoning district.

Turbine locations were modeled based on the preliminary sites selected based on the general turbine manufacturers requirements. Depending upon WTG manufacturer(s) and model(s) chosen, the WTGs will be approximately 80 to 152 meters (265 to 500 feet) in total height, measured from the top of the foundation to blade tip with a blade in the vertical position, and the power output of the individual WTGs will be 3 MW (Nom.). The modeling analysis used profile data for the Vestas 3.0 MW unit; all power and noise outputs are nominal and vary by wind speed.

The study considered the residential areas identified as being within one-mile of the Project boundary and one half mile in the prevailing downwind direction (**Figure 2**, “Base Map Showing Nearby Sensitive Receptors”). Three noise sampling locations were selected in the project area. The noise data was gathered at these locations for periods of over 24 hours each. These data sets were used to represent the area background as discussed in **Attachment 1**, “Background Noise Investigation.”

The project activity noise was modeled for Project site using a finite element model for each general turbine location, which factors in the noise source’s location, spectrographic data, terrain

and surface conditions. Locations of each turbine may be adjusted to reflect the size of the subject turbine and adjacent turbines, wind regime and other considerations such as proximity to sensitive receptors.

This noise study's analyses and findings are complete based on the Project Description and proposed mitigations.

WZI is a professional services consulting firm with experience in regulatory compliance, environmental engineering and geology. The members of WZI are State of California Registered Environmental Assessors, Registered Engineers and Geologists. WZI expresses no opinion as to disciplines, subjects and practices outside those specifically enumerated above. Further, WZI expresses no opinion herein as to any matters of California or federal law. This study is based on the foregoing and subject to the limitations, qualifications, exceptions and assumptions set forth herein.

2 SUMMARY

WZI assessed the Audible Noise Impacts using Finite Element Analysis. In order to assess the potential noise impacts, from this specific project, WZI uses a multi-tiered approach to noise assessment.

The proposed project was assessed in one consolidated model using Vestas 3.0 MW (Nom.) turbines (89 for Option A and 104 Option B), **Exhibit 1**, Noise Data, Vestas 3.0 Wind Turbines.

WZI then examined the effects of:

- Low Frequency Noise;
- Pure Tone Noise;
- Repetitive Impact Noise; and
- Construction Noise.

The summary of impacts and mitigations are in **Section 2.3**, "Summary Table of Impacts."

2.1 Background Noise (Pre-existing Conditions)

Noise data was collected at the sites specified in the area T32S, R35E MDBM and T11N, R13W SBBM (**Figure 3**, "Base Map Showing Monitoring Locations and Sensitive Receptors). The criterion for using the monitoring data is discussed in **Attachment 1**, "Background Noise Investigation."

The background noise data indicates that the Project vicinity is currently within Kern County's acceptable criteria of less than 65 dB(A) L_{dn} . Background noise gathered at the nearest sensitive receptor areas shows an existing noise level of 49 dB(A) $L_{8.3}$ to 61 dB(A) $L_{8.3}$. A major portion of this noise is associated with the strong winds and the existing wind turbines in the area as well as noise from SR58 refer to **Section 4.0**, "Existing Environment," of this study. Many of these existing wind turbines are smaller and noisier. As the larger turbines are installed these older less efficient units will be replaced by the newer turbines such as the Vestas 3.0 MW unit proposed in this project.

2.2 Thresholds for Impact Analysis

The following thresholds were used to assess the noise impacts:

- Is the existing outside noise level in the general area at, or below 65 dB[(A)]?
- Does audible noise from wind turbines cause the exterior noise level to exceed the Kern County limit for more than five (5) minutes out of any one- (1-) hour time period ($L_{8.3}$) or to exceed the limit for any period of time when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library?
- Does low frequency noise or infrasound from wind turbine operations cause the exterior noise level to exceed the Kern County limits when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library?
- Does audible noise due to wind turbine operations contain a steady pure tone, such as a whine, screech, or hum, that cause the noise level to exceed the Kern County limits for low frequency noise?
- Does audible noise due to wind turbine operations contain repetitive impulsive sounds that cause the noise level to exceed the Kern County limit?
- Does the construction-related activity cause the outside noise level to exceed Kern County limits for construction noise?

Refer to **Section 3.0**, “Regulatory Background” for discussion.

2.3 Summary Table of Impacts

Kern County Thresholds	Impact	Applicable Mitigation	Residual Impact	Cumulative Impact
Is the existing outside noise level in the general area at, or below 65 dBI(A)?		None	None	None
Does audible noise from wind turbines cause the exterior noise level to exceed the Kern County limit for more than five (5) minutes out of any one- (1-) hour time period ($L_{5.3}$) or to exceed the limit for any period of time when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library?		Noise -1: For those receptors areas that are affected by the wind turbines, the project developer shall obtain waivers and a noise easement from the affected property owners. Noise -2: In the event the developer proposes to locate any turbine closer to the boundary than the locations defined for that section in this noise study, the developer shall provide a report showing that the proposed turbine and location does not increase the impacts in this study. Noise-3: In the event a complaint is filed and it is determined as part of the complaint response that (a) certain turbine(s) emit noise that is found to exceed the Kern County $L_{5.3}$ Standards for Wind Energy Combining District under certain wind regimes, then the developer may, after conferring with the County as part of the noise complaint resolution, adjust the specific turbine(s) control set points to lower the cutoff speed to avoid operation during those conditions of wind direction and speed where the specific turbine(s) are causing complaints.	Less than Significant	Less than Significant
Does low frequency noise or infrasound from wind turbine operations cause the exterior noise level to exceed the Kern County limits when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library?		Noise -1: For those receptors areas that are affected by the wind turbines, the project developer shall obtain waivers and a noise easement from the affected property owners. Noise -2: In the event the developer proposes to locate any turbine closer to the boundary than the locations defined for that section in this noise study, the developer shall provide a report showing that the proposed turbine and location does not increase the impacts in this study. Noise-3: In the event a complaint is filed and it is determined as part of the complaint response that (a) certain turbine(s) emit noise that is found to exceed the Kern County $L_{5.3}$ Standards for Wind Energy Combining District under certain wind regimes, then the developer may, after conferring with the County as part of the noise complaint resolution, adjust the specific turbine(s) control set points to lower the cutoff speed to avoid operation during those conditions of wind direction and speed where the specific turbine(s) are causing complaints.	Less than Significant	Less than Significant

Kern County Thresholds	Impact	Applicable Mitigation	Residual Impact	Cumulative Impact
Does audible noise due to wind turbine operations contain a steady pure tone, such as a whine, screech, or hum, that cause the noise level to exceed the Kern County limits for low frequency noise?		None	None	None
Does audible noise due to wind turbine operations contain repetitive impulsive sounds that cause the noise level to exceed the Kern County limit?		None	None	None
Does the construction-related activity cause the outside noise level to exceed Kern County limits for construction noise?		Noise-4: The applicant shall limit noise-generating construction activities to the following hours: between 5:30 a.m. and as late as 9:00 p.m. Monday through Saturday. If required to meet critical schedule milestones, construction may also occur between 7:00 a.m. and 6:00 p.m. on Sundays. Noise-5: The applicant shall cover equipment engines and ensure that mufflers are in good working condition. Noise-6: The applicant shall locate all stationary equipment such as compressors and welding machines away from noise receptors to the extent practicable.	Less than Significant	Less than Significant

CEQA Thresholds	Impact	Applicable Mitigation	Residual Impact	Cumulative Impact
Does the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than Significant	None	None	None

CEQA Thresholds	Impact	Applicable Mitigation	Residual Impact	Cumulative Impact
Does the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Less than Significant	None	None	None
Does the project result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Less than Significant	None	None	None
Does the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Less than Significant	None	None	None
Is the project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	None	None	None	None
Is the project within the vicinity of a private airstrip, if so, would the project expose people residing or working in the project area to excessive noise levels?	None	None	None	None

2.4 Summary of Audible Noise Impacts

Refer to **Section 5.4** for detailed discussion regarding the audible impacts and mitigations.

2.4.1 Impacts of Audible Noise

In the event the developer situated a WTG closer to a sensitive receptor than the locations specified in the analysis, the noise level impact could be potentially significant without mitigation.

To ensure that the impacts comply with the Kern County General Plan and Wind Energy Ordinance, the following mitigations are suggested.

2.4.2 Mitigation of Audible Noise Impacts

Noise – 1: For those receptors areas that are affected by the wind turbines, the project developer shall obtain waivers and a noise easement from the affected property owners.

Noise – 2: In the event the developer proposes to locate any turbine closer to the boundary than the locations defined for that section in this noise study, the developer shall provide a report showing that the proposed turbine and location does not increase the impacts in this study.

Noise – 3: In the event a complaint is filed and it is determined as part of the complaint response that (a) certain turbine(s) emit noise that is found to exceed the Kern County L₈ Standards for Wind Energy Combining District under certain wind regimes, then the developer may, after conferring with the County as part of the noise complaint resolution, adjust the specific turbine(s) control set points to lower the cutoff speed to avoid operation during those conditions of wind direction and speed where the specific turbine(s) are causing complaints.

Level of Significance after Mitigation

Impacts would be *less than significant*.

2.4.3 Residual Audible Noise Impacts

Provided the project adopts all instances where **Noise-1** and **Noise-2** are required, the residual audible impacts for the Project will be *less than significant*. **Noise-3** will function to ensure that even when a receptor, for whom there is no easement, expresses a concern about a potential impact, the mitigation will effect a reduction in the noise generating potential and result in operating conditions that will result in *less than significant* impacts.

Therefore:

The impacts are below the Kern County specified criteria and are considered *less than significant* for northern and southern Receptor Areas.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

2.4.4 Cumulative Impact

The project impact area in conjunction with the existing wind park area encompasses a large area with numerous potential wind patterns that can result in a single instance of an exceedance of the Kern County Standards, a contribution of which can be attributed to the proposed project. The project noise impacts are mitigated with **Noise-1** through **Noise-3** to less than significant therefore residual cumulative audible impacts are considered *less than significant*.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

2.5 Summary of Low Frequency Impacts

2.5.1 Impacts of Low Frequency Noise

For frequencies below 50 Hz the impact due to infrasound is not significant and that at frequencies below 125 Hz to 50 Hz at a distance of 1400 feet from the wind turbines all frequency bands are below the Kern County's specific frequency based threshold.

In the event the developer situated a WTG closer to a sensitive receptor than the locations specified in the analysis, the noise level impact could be potentially significant without mitigation.

To ensure that the impacts comply with the Kern County General Plan and Wind Energy Ordinance, the following mitigations are suggested.

2.5.2 Mitigation of Low Frequency Impacts

See **Section 2.4.2** above.

2.5.3 Residual Impact of Low Frequency Noise

Provided the project adopts all instances where **Noise-1** and **Noise-2** are required, the residual audible impacts for the Project will be *less than significant*. **Noise-3** will function to ensure that even when a receptor, for whom there is no easement, expresses a concern about a potential impact, the mitigation will effect a reduction in the noise generating potential and result in operating conditions that will result in *less than significant* impacts.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

2.5.4 Cumulative Impact

The project impact area in conjunction with the existing wind park area encompasses a large area with numerous potential wind patterns that can result in a single instance of an exceedance of the

Kern County Standards, a contribution of which can be attributed to the proposed project. The project noise impacts are mitigated with **Noise-1** through **Noise-3** to less than significant therefore residual cumulative audible impacts are considered *less than significant*.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

2.6 Summary of Pure Tone Impacts

2.6.1 Impact of Pure Tone Noise

No specific 1/3 sound power level individually exceeds the arithmetic average of the two adjacent noise levels by the specified range; therefore there are no pure tones impacts for the Vestas 3.0 MW wind turbine.

2.6.2 Mitigation of Pure Tone Impacts

None

2.6.3 Residual Impact of Pure Tone Noise

None

2.6.4 Cumulative Impact

None

2.7 Summary of Repetitive Impacts

2.7.1 Impact

There are no expected audible impulse noises from a normally operating unit.

2.7.2 Mitigation

None

2.7.3 Residual Impact

None

2.7.4 Cumulative Impact

None

2.8 Summary of Construction Impacts

2.8.1 Impact

The construction impacts are considered significant for the duration of the construction activity within 3,000 feet adjacent to a residence.

2.8.2 Mitigation

Noise -4: The applicant shall limit construction noise-generating activities to the following hours: between 5:30 a.m. and as late as 9:00 p.m. Monday through Saturday. If required to meet critical schedule milestones, construction may also occur between 7:00 a.m. and 6:00 p.m. on Sundays.

Daytime noise levels do not present a problem in the general area. Most receptors are accustomed to the daytime noise levels associated with the wind park operations.

Noise – 5: The applicant shall cover equipment engines and ensure that mufflers are in good working conditions.

Proper design of noise reducing elements in construction can serve to reduce sound power levels by 10 to 20 dB(A).

Noise – 6: The applicant shall locate all stationary equipment such as compressors and welding machines away from noise receptors to the extent practicable.

Specific turbine locations that show potential construction impacts may be adjusted or eliminated; however, the wind regime will make it difficult to completely remove the “potential” for impacts from the general area without mitigations.

Level of Significance after Mitigation

Impacts would be *less than significant*.

2.8.3 Residual Impact

The project impacts will be mitigated with **Noise-4** through **Noise-6** to *less than significant*.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

2.8.4 Cumulative Construction Impact

Construction noise will cease once the Project is built out, therefore the construction noise cumulative impact is *less than significant*.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

3 REGULATORY BACKGROUND

Noise generated by the Project was assessed against California Environmental Quality Act (CEQA) noise related requirements and the Noise Element of the Kern County General Plan.

The discussions in the Noise Element, as well as this study, rely on definitions unique to noise related studies and impacts. Several key definitions used throughout this study include:

dB – Decibel, the unit of sound pressure measurement.

A-Weighting – The A-weighting is most commonly used in law and the sound levels are read in dB(A) scale.

CNEL – Community Noise Equivalent Level. The average sound pressure obtained over a 24-hour noise study, with additional factors for time of day. Sound pressures between the hours of 7 P.M. and 10 P.M. are algebraically increased by 5 dB prior to being averaged. Sound pressures between the hours of 10 P.M. and 7 A.M. are algebraically increased by 10 dB prior to being averaged.

L_{dn} – Day/Night Sound Level. The average sound pressure obtained over a 24-hour noise study, with additional factors for time of day. Sound pressures between the hours of 10 P.M. and 7 A.M. are algebraically increased by 10 dB prior to being averaged.

L_{eq} – The average integrated sound level accumulated while the noise monitor is in the run mode. L_{EQ} represent the mean value.

L_N – The SPL exceeded for N% of the time during a noise study. The typical values are L₅, L₁₀, L₅₀ and L₉₀. Kern County use L₈ in their Wind Energy requirements. L₅₀ represents the median value. L₀ represents the peak value.

SPL – Sound Pressure Level. A measurement of the noise source expressed in decibels dB. A standard sound level meter measures the sound pressure level.

3.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that projects needing discretionary permits be evaluated for their potential to create significant noise impacts. Under CEQA, a significant effect from noise may exist if a project would result in:

- a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*
- b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?*
- c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?¹

3.2 State Noise Standards

According to California Noise law the state is to encourage the enactment and enforcement of local ordinances in those areas which are most properly the responsibility of local government. It is further the purpose to insure that the state is of maximum assistance to local agencies in the discharge of those responsibilities, furnishing technical and legal expertise to assist local agencies in the enactment and enforcement of meaningful and technically sufficient noise abatement measures. Therefore, the Kern County General Plan Noise Element supersedes state noise standards.

3.3 Kern County General Plan Noise Element

The Noise Element of the Kern County General Plan (**Attachment 2**) sets forth policies and recommendations applicable to the proposed Project. Kern County General Plan Noise Element requires that indoor noise levels in habitable rooms be limited to 45 dB(A) L_{dn} . The typical attenuation factor for structures with closable windows is 20 dB, the maximum noise level in outside living areas, such as yards, is required to be 65 dB(A).² A noise level of 65 dB(A) L_{dn} is considered the upper limit for noise-sensitive receptors such as homes, schools, hospitals and churches.

Kern County considers noise levels to be satisfactory in outdoor agricultural areas when they are at, or below, an L_{dn} of 65 dB(A). CEQA does not define the noise level increase that would be considered substantial. However, **Table 3.3-1**, "Perceived Change in Decibel Level" shows commonly accepted effects in perception stemming from changes in sound level.

¹ http://ceres.ca.gov/topic/env_law/ceqa/guidelines/Appendix_G.html

² Kern County General Plan Noise Element, pp 148-149.

Table 3.3-1
Perceived Change in Decibel Level³

Change in Sound Level (dB)	Perceived Change to the Human Ear
1	Not Perceptible
3	Threshold of Perception
5	Clearly Noticeable
10	Twice (or Half) as Loud
20	Fourfold (4X) Change

Residential Areas

Kern County considers noise levels to be satisfactory in outdoor areas when they are at, or below 65 dB[(A)].

The relevant Kern County General Plan Noise Element policies follow:

- Policy #1: Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.
- Policy #2: Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of California Division of Occupational Safety and Health (DOSH).
- Policy #5: Prohibit new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design. Such mitigation shall be designed to reduce noise to the following levels:
- a) 65 dB L_{dn} or less in outdoor activity areas
 - b) 45 dB L_{dn} or less within interior living spaces or other noise sensitive interior spaces.
- Policy #7: Employ the best available methods of noise control.

The relevant implementation of the policies is as follows:

- C) *Review discretionary development plans, programs and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policy framework outlined in this element.*
- D) *Review discretionary development plans for proposed residential or other noise sensitive land uses in noise-impacted areas to ensure their conformance with the noise standards of 65 dB L_{dn} or less in outdoor activity areas and 45dB L_{dn} or less within interior living spaces.*

³ A Guide to Noise Control In Minnesota, (Acoustical Properties, Measurement, Analysis, Regulation), Minnesota Pollution Control Agency

3.4 Kern County Wind Energy Combining District WE (20) Noise Requirements

Where a residence, school, church, public library, or other sensitive or highly sensitive land use, as identified in the Noise Element of the County General Plan, is located within one (1) mile in a prevailing downwind direction or within one-half (1/2) mile in any other direction of a project's exterior boundary, an acoustical analysis shall be prepared by a qualified acoustical consultant prior to the issuance of any building permit. The consultant and the resulting report shall be subject to review and approval by the Kern County Health Department [Kern County Public Health Department]. The report shall address any potential impacts on sensitive or highly sensitive land uses.

In addition, the acoustical report shall demonstrate that the proposed development shall comply with the following criteria:

1. Audible noise due to wind turbine operations shall not be created which causes the exterior noise level to exceed forty-five (45) dBA for more than five (5) minutes out of any one- (1-) hour time period ($L_{8,3}$) or to exceed fifty (50) dBA for any period of time when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library.
2. Low frequency noise or infrasound from wind turbine operations shall not be created which causes the exterior noise level to exceed the following limits when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library.

One-third Octave Bank Center Frequency (Hz)	Sound Pressure Level (dB)
2 to 1	70 (each band)
20	68
25	67
31.5	65
40	62
50	60
63	57
80	55
100	52
125	50

3. In the event audible noise due to wind turbine operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by five (5) dBA. A pure tone is defined to exist if the one-third (1/3) octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two (2) contiguous one-third (1/3) octave bands by five (5) dBA for center frequencies of five hundred (500) Hz and above, by eight (8) dBA for center frequencies between one hundred and sixty (160) Hz and four hundred (400) Hz, or by fifteen (15) dBA for center frequencies less than or equal to one hundred and twenty-five (125) Hz.

4. In the event the audible noise due to wind turbine operations contains repetitive impulsive sounds, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by five (5) dBA.
5. In the event the audible noise due to wind turbine operations contains both a pure tone and repetitive impulsive sounds, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by a total of five (5) dBA.
6. In the event the ambient noise level (exclusive of the development in question) exceeds one (1) of the standards given above, the applicable standard shall be adjusted so as to equal the ambient noise level. For audible noise, the ambient noise level shall be expressed in terms of the highest whole number sound pressure level in dBA[,] which is exceeded for no more than five (5) minutes per hour ($L_{8,3}$). For low frequency noise or infrasound, the ambient noise level shall be expressed in terms of the equivalent level (L_{eq}) for the one-third ($1/3$) octave band in question, rounded to the nearest whole decibel. Ambient noise levels shall be measured within fifty (50) feet of potentially affected existing residences, schools, hospitals, churches, or public libraries. Ambient noise level measurement techniques shall employ all practical means of reducing the effects of wind-generated noise at the microphone. Ambient noise level measurements may be performed when wind velocities at the proposed project site are sufficient to allow wind turbine operation, provided that the wind velocity does not exceed thirty (30) mph at the ambient noise measurement location.
7. Any noise level falling between two (2) whole decibels shall be the lower of the two (2).
8. In the event that noise levels, resulting from a proposed development, exceed the criteria listed above, a waiver to said levels may be granted by the Planning Director provided that the following has been accomplished:
 - a. Written consent from the affected property owners has been obtained stating that they are aware of the proposed development and the noise limitations imposed by this code, and that consent is granted to allow noise levels to exceed the maximum limits allowed.
 - b. A permanent noise impact easement has been recorded in the County Hall of Records which describes the benefited and burdened properties and which advises all subsequent owners of the burdened property that noise levels in excess of those permitted by this code may exist on or at the burdened property.

3.5 Threshold Criteria

3.5.1 Kern County General Plan and Wind Energy Combining District

Background Criteria

Is the existing outside noise level in the general area at, or below 65 dB[(A)]?

Audible Noise

Does audible noise from wind turbines cause the exterior noise level to exceed the Kern County limit for more than five (5) minutes out of any one- (1-) hour time period ($L_{8.3}$) or to exceed the limit for any period of time when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library?

Low Frequency Noise

Does low frequency noise or infrasound from wind turbine operations cause the exterior noise level to exceed the Kern County limits when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library?

Pure Tone

Does audible noise due to wind turbine operations contain a steady pure tone, such as a whine, screech, or hum, that cause the noise level to exceed the Kern County limits for low frequency noise?

Repetitive Noise

Does audible noise due to wind turbine operations contain repetitive impulsive sounds that cause the noise level to exceed the Kern County limit?

Construction Noise

Does the construction noise cause the outside noise level to exceed Kern County limits for construction noise?

3.5.2 General CEQA Criteria

In addition to the Kern County Criteria, CEQA provides several additional criteria. Several of the CEQA criteria “General Compliance Criteria” and “Background Exceedance” are redundant. This noise study includes the related analysis of Vibration and Airport criteria.

General Compliance Criteria

Does the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Vibration Criteria

Does the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Background Exceedance Criteria

Does the project result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Does the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Airport Criteria

For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Is the project within the vicinity of a private airstrip, if so, would the project expose people residing or working in the project area to excessive noise levels?

4 EXISTING ENVIRONMENT

As previously mentioned, the zoning in the 8 sections that reside in the immediate Project vicinity is AWE, A-1 and E(20). Noise in the vicinity is dominated by alpine wind noise, wind turbine noise, and SR 58 in the wind farm area.

4.1 Noise Monitoring Data

Noise measurements were obtained at a central site on the property to quantify background conditions. Long term measurements were obtained. CH2m/Hill and WZI recorded and documented sound levels at the locations as shown on **Figure 3** “Base Map Showing Monitoring Locations and Sensitive Receptors.” A discussion of the general Background noise data and its affect on thresholds is found in **Attachment 1**, “Background Noise Investigation.”

Table 4.1-1 shows the summary of the noise data gathered for this analysis. General recorded data and time related charts are in **Attachment 3** “Noise and Meteorological Data.”

**Table 4.1-1
Long Term Background Noise Data**

Background Sampling for Threshold Analysis									
Location	Monitor Coordinates		Sampling Date		Met Data			Background Data, dB(A)	
					Wind Speed	Dir		L ₁	L _{8.33}
	Long.	Lat.	Start	End	m/s	deg.	fps	dB(A)	dB(A)
1	118° 13' 8" W	35° 7' 29" N	9/7/10 13:10	9/12/10 6:20	5.5	214.0	17.8	53.0	49.0
2	118° 14' 18" W	35° 4' 51" N	9/7/10 11:50	9/9/10 12:50	7.0	268.1	22.4	56.0	52.0
3	118° 13' 9" W	35° 7' 9" N	3/22/11 8:21	3/23/11 8:51	5.0	240.5	16.1	65.0	61.0

Attachment 3, “Noise and Meteorological Data”, contains the time-tagged met and monitoring data for each Monitoring Location.

North Residential Area

Monitoring Location #3 (350 feet north of SR 58) shows the expected combined effect of both SR58 and the Railroad. Monitoring Location #1 2200 feet to the north of SR 58 shows a more typical regional background. The Monitoring Location #1 is considered to be the appropriate threshold for receptors along Pony Express. The Monitoring Location #3 (off- Highway noise) was considered applicable to receptors along Rock House Road.

Depending on distance from SR 58, the background for receptors along the north-south street segments extending between Rock House Road and Pony Express (i.e., Wild Flower Rd., Luna Dr., Lera Ln., Quail Canyon Rd., Dove Ln., Opiute Pass and West Av.) range from $L_1=65\text{dBA}$ and $L_8 = 61\text{dBA}$ to $L_1= 53\text{dBA}$ and $L_8 = 49 \text{ dBA}$. That portion of Piute Pass (approximately 700 feet north of SR 58) running parallel to SR 58 has L_1 and L_8 threshold levels of 60 dBA and 56 dBA, respectively.

South Residential Area

Monitoring Location #2 shows the area-wide noise levels for the receptor region bounded by Arroyo Road to the South, 50th Street to the East and 60th Street to the West. The L_1 and L_8 background level for all receptors on road segments lying within these bounds is considered to be 56dBA and 52dBA, respectively.

The empirical L_8 values ranged from 49 to 61 dB(A). The levels are defined by the wind speed, local topography, foliage and proximity to existing wind turbines.

General Project Area

Wind generated ambient noise increases as a function of windspeed. Area measurements have established that the L_8 noise level for wind speeds above 5 m/s to 13 m/s generally follows:

$$dB(A)L_8 = 26.253 \times \ln(\text{wind velocity in m/s}) + 2.5117$$

Below 5 m/s the background noise is dominated by the normal non-WTG operating noise generating activities and results are typically around 49 dB(A) L_8 . Above 13 m/s the wind generated ambient noise approaches 70 dB(A) L_8 asymptotically.⁴

The background for the general project area is based on:

for prevailing wind speeds of 30 feet per second (9m/s) = 60dB(A) (the general noise level equation above for wind speeds between 5m/s and 13 m/s).

⁴ Kern County EIR for PdV Wind Project, Appendix, Noise Study.

4.2 Wind

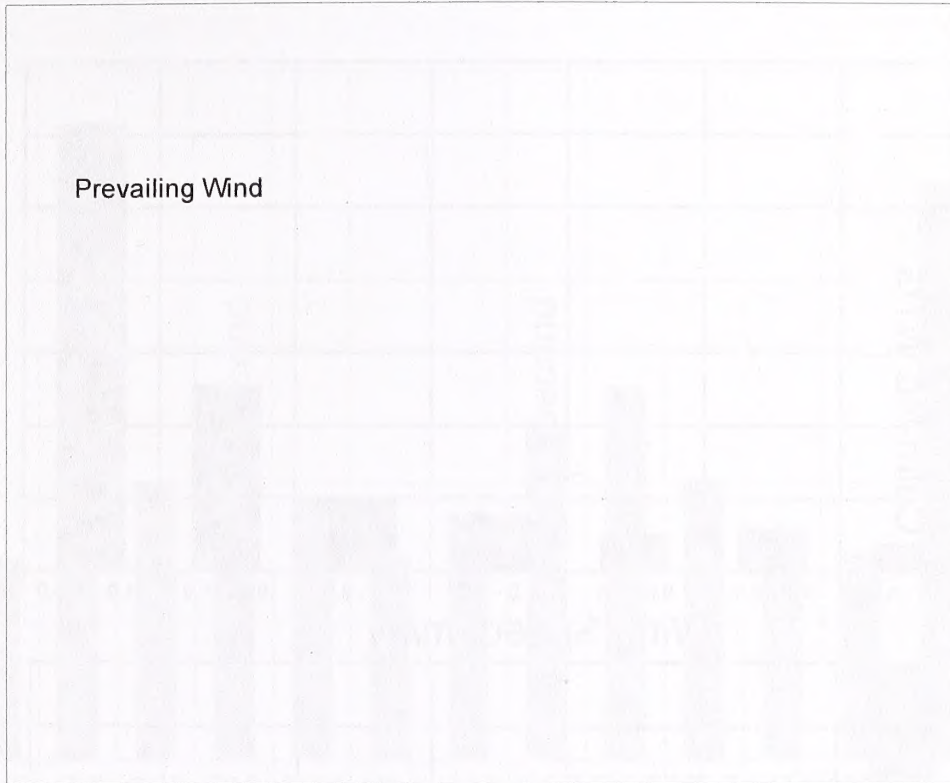
The general annual wind rose below shows a characteristic wind pattern for the Tehachapi Mojave Wind Resources Area (WRA). The general wind rose shows the winds blowing from prevailing direction, i.e. 315 degrees, 70% of the time.

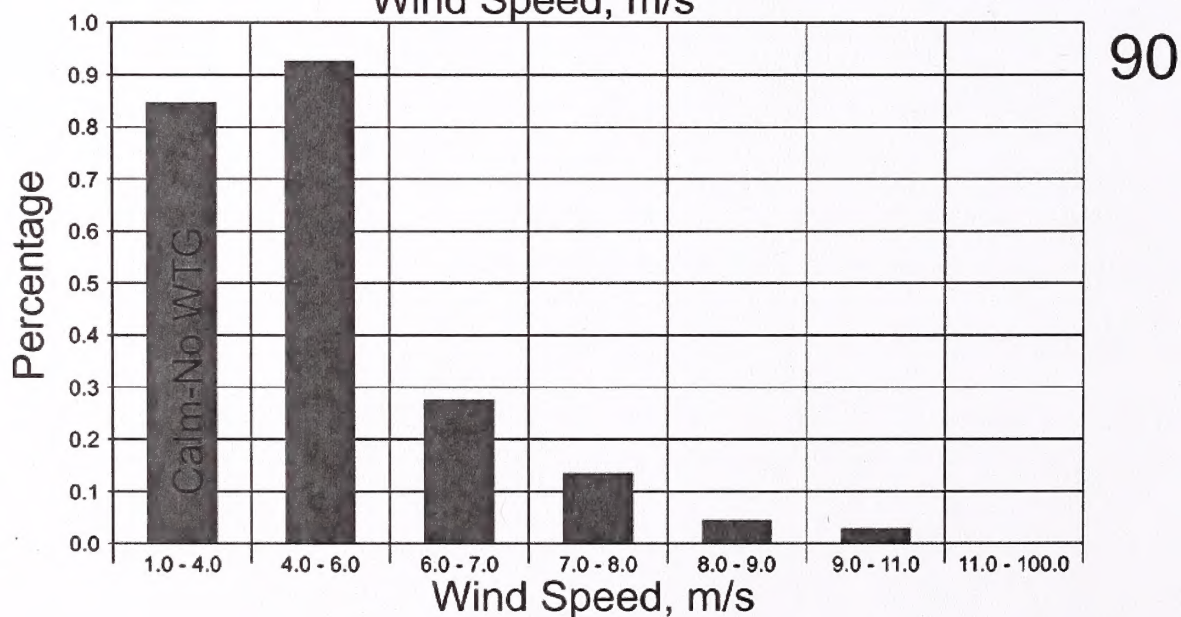
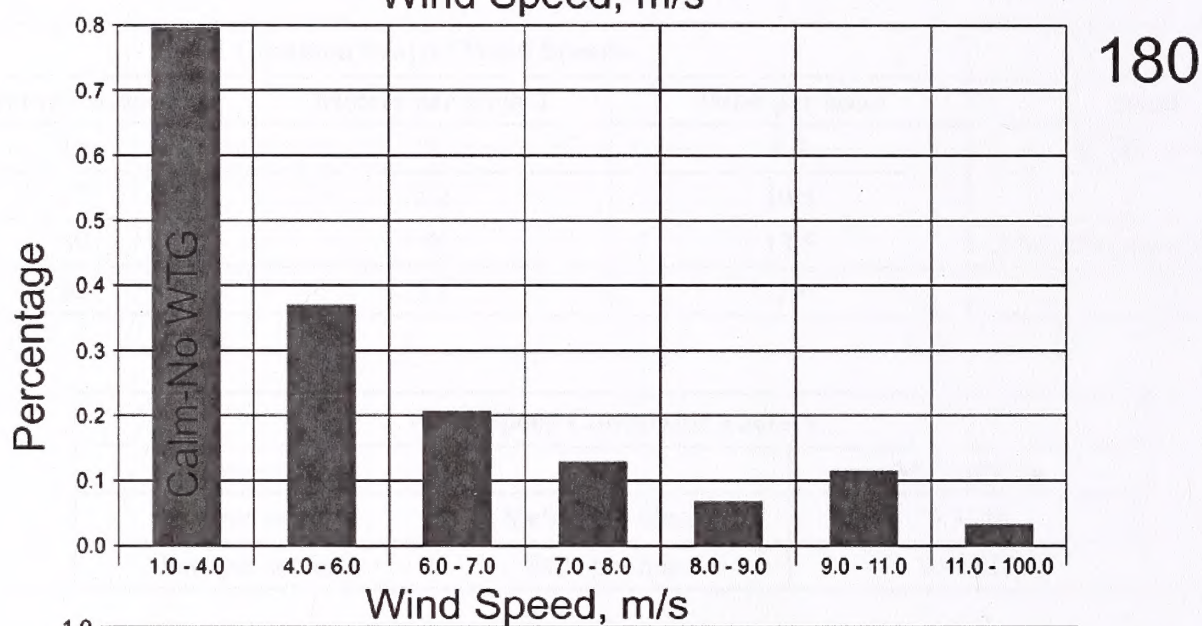
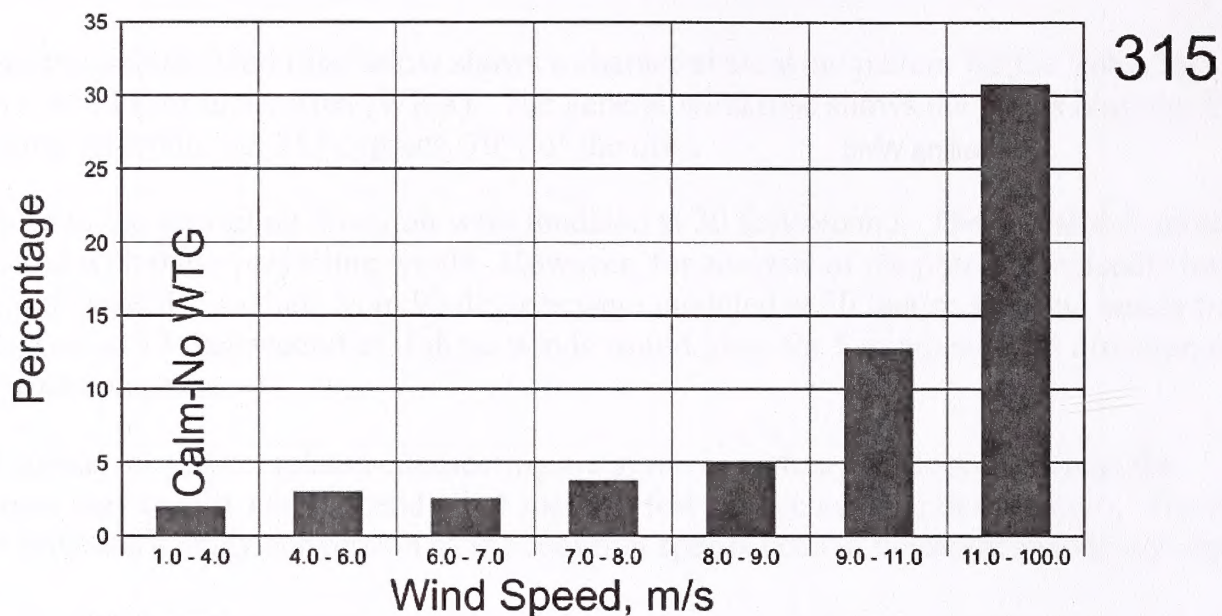
Winds from the prevailing direction were modeled at 30 feet/second. The L_8 value is most likely associated with these prevailing winds. However, for analysis of the potential episodic impacts that might exceed L_8 ; winds from 90 degrees were modeled at 30 feet/second and winds from 180 degrees at 17 feet/second as if these winds would blow for 5 minutes in the direction of any downwind receptors.

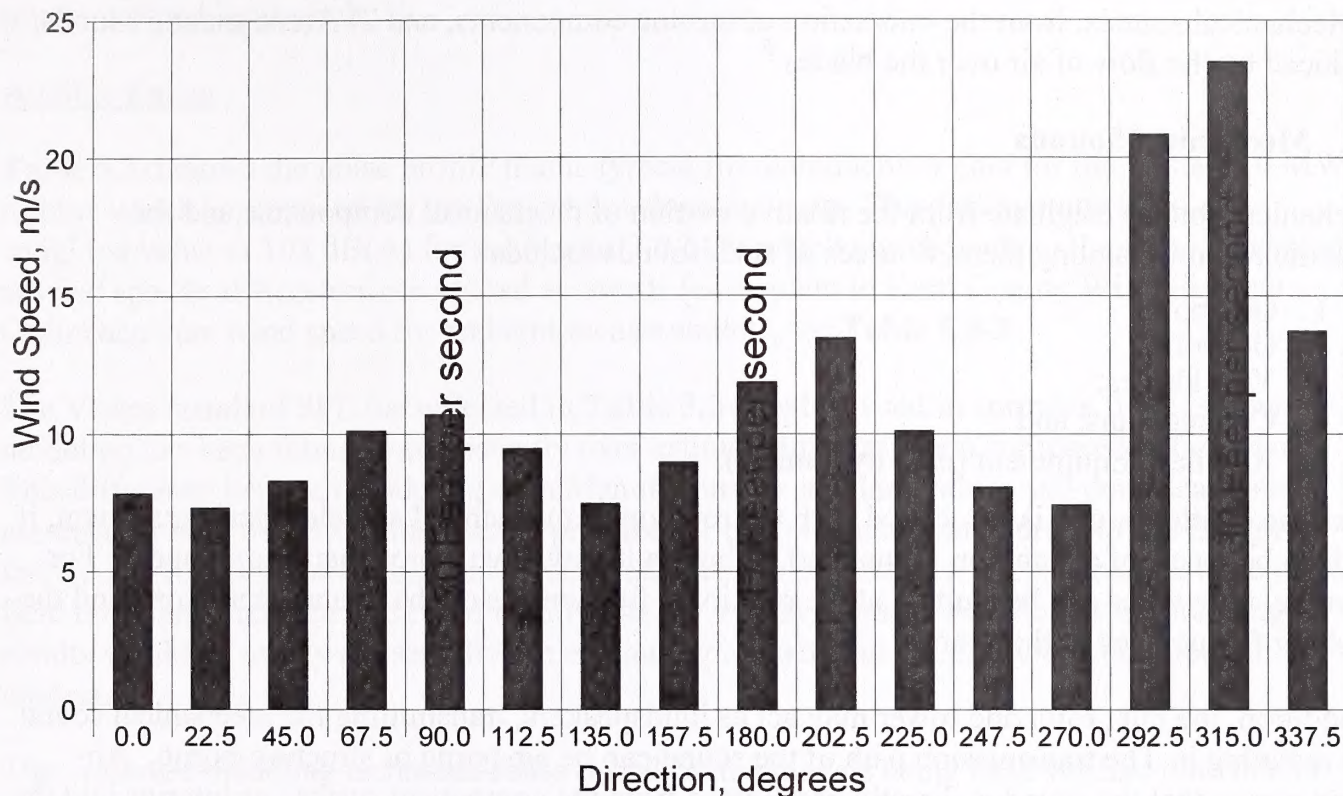
Wind speeds for project related engineering are given in meters per second whereas the layperson may readily comprehend wind speed in feet per second or miles per hour. The table below provides a ready conversion of the common speeds used in the study and the conversion factor.

Common Project Wind Speeds			
Feet per second	Meters per second	Miles per hour	Notes
10	3	6.2	WTG cut-in
17	5.2	10.5	
30	9	18.5	County Background Limit
82	25	50	

Wind Speed Conversion Factors		
To convert from	To	Multiply by
Feet per second	Meters per second	0.3048
Feet per second	Mile per hour	0.61818







5 IMPACTS

5.1 Sources of Wind Turbine Noise

There are four types of sound that can be generated by wind turbine operation: tonal, broadband, low frequency and impulsive:

1. Tonal: Tonal sound is defined as sound at discrete frequencies. It is caused by components such as meshing gears, non-aerodynamic instabilities interacting with a rotor blade surface, or unstable flows over holes or slits or a blunt trailing edge.
2. Broadband: This is sound characterized by a continuous distribution of sound pressure with frequencies greater than 100 Hz. It is often caused by the interaction of wind turbine blades with atmospheric turbulence, and also described as a characteristic "swishing" or "whooshing" sound.
3. Low frequency: Sound with frequencies in the range of 20 to 100 Hz is mostly associated with *downwind* rotors (turbines with the rotor on the downwind side of the tower). It is caused when the turbine blade encounters localized flow deficiencies due to the flow around a tower.
4. Impulsive: This sound is described by short acoustic impulses or thumping sounds that vary in amplitude with time. It is caused by the interaction of wind turbine blades with disturbed air flow around the tower of a downwind machine.

The sources of sounds emitted from operating wind turbines can be divided into two categories: 1) Mechanical sounds, from the interaction of turbine components, and 2) Aerodynamic sounds, produced by the flow of air over the blades.⁵

5.2 Mechanical Sounds

Mechanical sounds originate from the relative motion of mechanical components and the dynamic response among them. Sources of such sounds include:

1. Gearbox;
2. Generator;
3. Yaw Drives;
4. Cooling Fans; and
5. Auxiliary Equipment (e.g., hydraulics).

Since the emitted sound is associated with the rotation of mechanical and electrical equipment, it tends to be tonal (of a common frequency), although it may have a broadband component. For example, pure tones can be emitted at the rotational frequencies of shafts and generators, and the meshing frequencies of the gears.

In addition, the hub, rotor and tower may act as loudspeakers, transmitting the mechanical sound and radiating it. The transmission path of the sound can be air-borne or structure-borne. Air-borne means that the sound is directly propagated from the component surface or interior into the air. Structure-borne sound is transmitted along other structural components before it is radiated into the air.⁶ Modern wind turbine generators are designed to minimize noise.⁷

All proposed wind turbine units are upwind designs. The tower and the nacelle are streamlined giving an aerodynamic shape to any protruding features and to the nacelle itself which reduces any noise that is created by the wind passing the turbine.

Soundproofing in nacelles reduces the noise from the generator, gears and other moving parts located in the turbine nacelle which produces mechanical noise. Soundproofing and mounting equipment on sound-dampening buffer pads helps to deal with mechanical noise.

The gearbox is specially-designed for quiet operation; the gear wheels are designed to flex slightly and reduce mechanical noise. In addition, special sound-dampening buffer pads separate the gearboxes from the nacelle frame to minimize the possibility that any vibrations could become sound.⁸

5.3 Turbine Noise

Large scale turbines generate electricity that is synchronized to the grid. To compensate for minor wind speed changes, they adjust the pitch of the blades into the wind. These adjustments change the sound power levels and frequency components of the noise. A turbine's sound

⁵ www.ceere.org/rerl

⁶ Ibid

⁷ Ibid

⁸ Vestas 3.0 MW General Specification, **Attachment 4**

power represents the sound energy at the center of the blades, which radiates from a point source defined by the hub.

Audible Range

Table 5.3-1 shows the noise profile that is typical for manufacturer data for the Vestas 3.0 MW turbine which is proposed for the Project development area. The data average to an A-weighted value of 108 dB(A) for the Vestas 3.0 MW which corresponds to the noise generated at wind speeds at 9 meters per second at speeds (equivalent to Kern County Wind Element Ordinance max wind speed for ambient measurement), see **Table 5.3-2**.

The Vestas standard SPL (as reflected in **Table 5.3-1**) when used in complex finite element modeling has been found to consistently over estimate impacts when compared to field data. This difference between modeling with Manufacturer's standard values and empirical data is assumed to be reflective of the normal practice for equipment manufacturers to use design factors and margins for contractual considerations such as warranty. In the absence of reliable field noise and met data one could readily use the Vestas standard data however, modeling results would be overly conservative in estimating impacts but the estimate would remain inaccurate.

The preferred modeling technique relies on calibrated models using field verified data that is reflective of the installed operating unit reflecting the local heights of hubs, tower design, local terrain and flora.

**Table 5.3-1
Estimated**

Vestas 3.0 A-weighted 1/1 Octave Band Sound Power Level based on Default Data

Freq.	31.5	63	125	250	500	1k	2k	4k	8k	16k	Lin/dBA
SPL	81	90	101	103	105	103	101	95	86	78	110.1/107.7

Table 5.3-2

Default Noise Profile for Wind Regime

Vestas 3.0 MW Typical Noise level as a function of wind speed at a Hub Height of 300 feet⁹

Wind Speed (meters per second)	4	5	6	7	8	9	10 to cutout
dB(A)	<97	102	106	107	108	108	107

The standard noise modeling SPL data provided by Vestas for the V90 was field checked for modeling by using data gathered at various locations relative one isolated V90 WTG.

Attachment 5, "Modeling Correction Based on Field Data" discusses the use of field verified data in detail.

⁹ Ibid

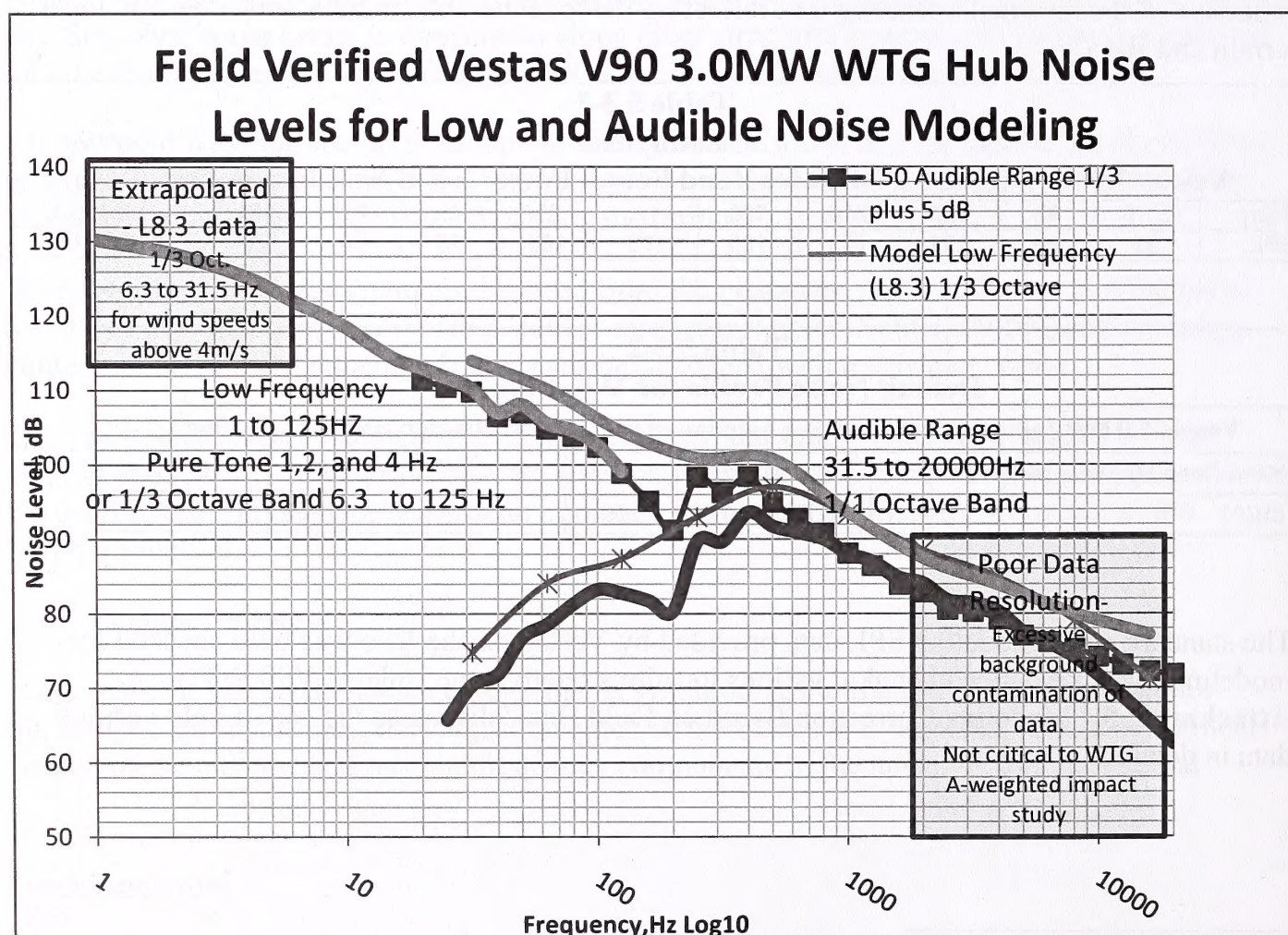
The Vestas Modeling curve was based on the 1/1/Octave noise profile for other similar Large WTG units mapped to conform to the maximum Hub Center dBA value provided by Vestas. **Table 5.3-3** shows the field verified modeling data for audible range modeling.

Table 5.3-3 Field Verified Vestas 3.0 A-weighted 1/1 Octave Band Sound Power Level											
Freq.	31.5	63	125	250	500	1k	2k	4k	8k	16k	Lin/dBA
SPL	81	114	110	105	101	101	97	94	87	80	115.1/102.3

Low Frequency

Conservatively, low frequency L8.3 data were sorted for the range of operation of the WTGs to ensure only WTG noise was being used and there was no low wind speed bias (i.e., 3 m/s and greater). L8.3 data were selected since will return higher values as opposed to Leq. The results were then extrapolated from 6.3 Hz to 1 Hz using a polynomial curve fit from 31.5 Hz. These far-field values were then used to back-calculate the Sound Pressure Level at the Hub accounting for radiative effect, air attenuation and the wind effect.

The figure below shows the Vestas Modeling SPL by 1/3 Octave Band.



5.4 ENM Noise Modeling

The Project's noise impacts were modeled by WZI at a range of 80 – 105 meters, varying by terrain, using a finite element noise analysis program (ENM)¹⁰ and background data gathered from the area. Where possible, WZI used the more conservative 80 meters for the analysis.

This program produces a noise contour plot of the noise level increment produced by the sources, with consideration given to the topography and terrain conditions. Current topography of the Project area consists of flat terrain considered to be primarily bare grassy fields. The increment of noise generated by the turbine is assessed in accordance with the Kern County Wind Energy Combining District WE (20) Noise Requirements.

Finite Element Modeling was performed for Vestas 3.0MW at three wind directions for both Option A and B:

- Case 1: Winds from 315 degrees at 30 feet per second;
- Case 2: Winds from 90 degrees at 30 feet per second; and
- Case 3: Winds from 180 degrees at 17 feet per second.

The solid lines on the Figures in the following **Section 5.4.2**, below show the modeling results for the Vestas 3.0 MW turbines.

5.4.1 Sound Power Levels

Noise from wind turbines is generated by blade sweep at rotational speeds defined by structural limitations of the blade in varying wind conditions. The general noise profiles are typically similar in pattern for all modern three-blade wind turbines, which turn at about 20 revolutions per minute; the speed is then matched to the generator via a gearbox for synchronization to the grid at 60 Hz. To compensate for minor wind speed changes, they adjust the pitch of the blades into the wind. These adjustments change the sound power levels.

The finite element model requires either 1/3 octave or 1/1 octave data. The sound power levels in dB which are used in the model for the Vestas 3.0 MW units are 1/1 octave data.¹¹

The graph below, (**Graph 5.4-1 “Vestas 3.0 MW Radiative Noise Attenuation”**), shows the general radiation attenuation associated with the distribution of a fixed energy source emitting in a spherical manner. There are no adjustments to account for effects such as molecular attenuation, terrain effects and wind pressure carrying the noise-related energy downwind in this radiation model. The more complex finite models such as ENM account for directivity, distance, air absorption, ground effects, barriers, reflections, and meteorology.

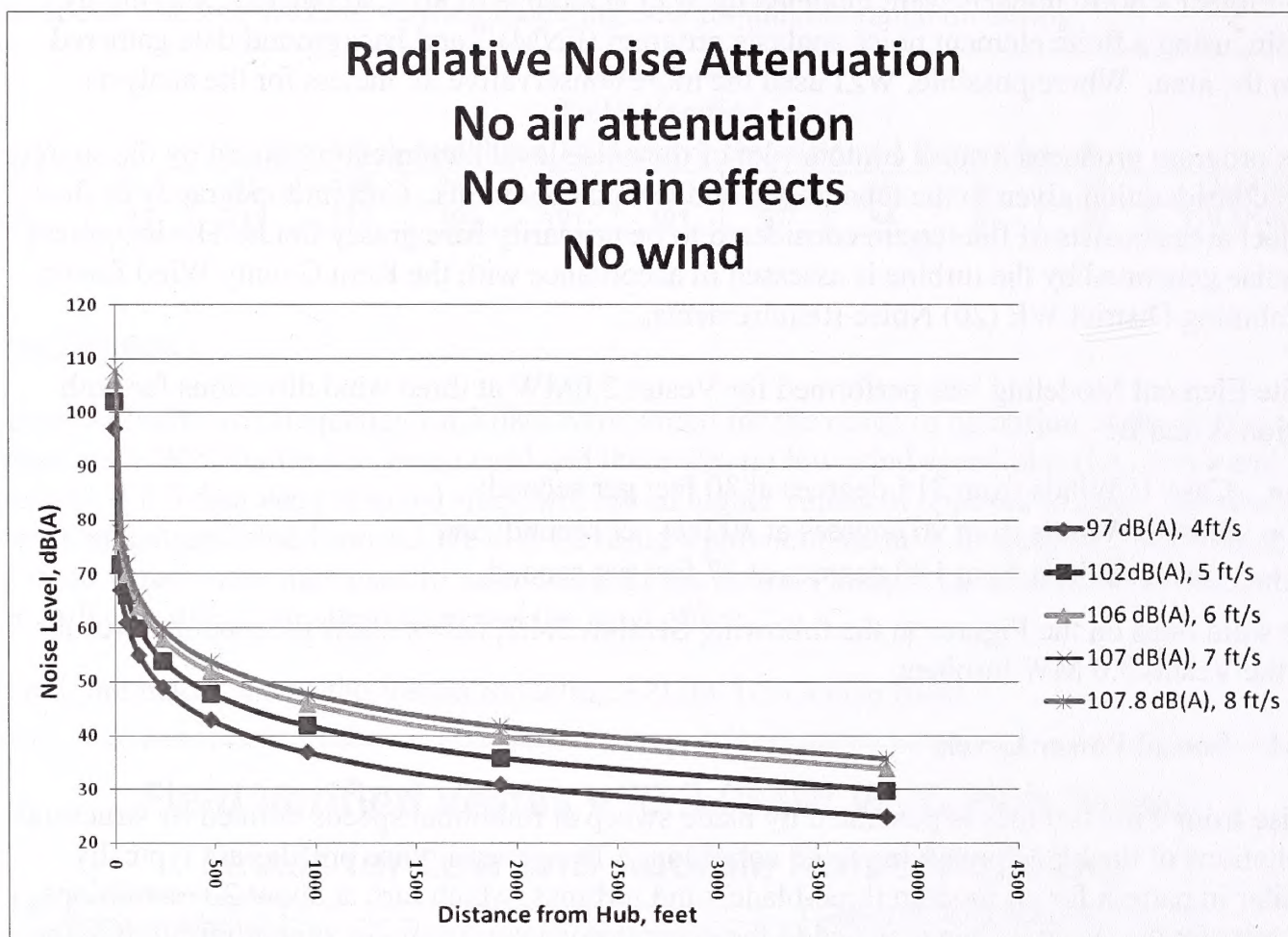
¹⁰ RTA Technology Pty Ltd, ENM for Windows, Version 3.06

¹¹ The typical noise spectrum is split into about 10 bands. These are called the Octave Bands because there is one octave between the bottom and top of each band. The center frequencies for these bands are usually:

31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz. A noise profile for a source or sound level meter provides data for each of the octave bands. The Octave Band data is usually designated by a “1/1”.

1/3 Octave Band Filters are very similar in nature to the 1/1 Octave Band. The difference is that each of the Octave Bands is split into three, giving a more detailed description of the frequency content of the noise. The 1/3 Octave Band Data is often designated with a “1/3”.

Graph 5.4-1
Vestas 3.0 MW Radiative Noise Attenuation



At specific gridded locations the finite modeling program starts with the simple radiative model above and makes calculations adjusting for:

- Propagation;
- Air Absorption;
- Ground Absorption;
- Directivity;
- Meteorology; and
- Terrain.

These modeling results are then converted to lines of equal sound pressure levels.

The modeling sources for the Vestas 3.0 WTG were field check and the model was calibrated for the general terrain and fauna as well as the field verified spectral profile, **Attachment 5**, “Modeling Corrections Based on Field Data.”

To allow for the additive effect of the incremental noise to background, 5 dB(A) are subtracted from the L_8 values at specific locations to conservatively estimate threshold exceedances in the graphs found in the following sections.

5.4.2 Modeling Results –Impact Analysis

Prevailing Winds (315 degrees)

Winds blow from northwest quadrant 61% of the time on an annual basis with wind speeds exceeding 30 feet per second, the point at which the turbines are feathered. The maximum sound power level was selected for modeling at both wind speeds **Exhibit 1** “Noise Data, Vestas 3.0 Wind Turbines.”

Turbine related noise for winds from the west, at 30 feet per second, will carry noise towards the North Residential Area in the north half of Section 27, T32S, R35E MDBM and the South Residential Area in Section 2, T11N, R13W SBBM, **Figure 4**, “Impact Analysis ENM-Model Predicted Noise Levels for Winds from 315 degrees, 30 ft/s.”

Northern Residential Area

Residential receptors in Section 27 will experience outside noise levels ranging from 46 dB(A) to 52 dB(A) from winds of 315 degrees, **Figure 5**, “Impact Analysis ENM-Model Predicted Noise Levels for Winds from 315 degrees, 30 ft/s Northern Sensitive Receptors.” The receptors will experience noise from turbines in Section 28, T32S, R35E MDBM.

Southern Residential Area

Residential receptors in Section 2 will experience outside noise levels ranging from 45 dB(A) to 56 dB(A) from winds of 315 degrees, **Figure 6**, “Impact Analysis ENM-Model Predicted Noise Levels for Winds from 315 degrees, 30 ft/s Southern Sensitive Receptors.” The receptors will experience noise from turbines in Sections 33 and 34, T12N, R13W SBBM.

The road segments with the highest impacts are the west segments of Rosewood, Dagle and Center as well as the Center and North segment of 60th Street. The strength of the proposed project WTG noise diminishes to 45dBA in the south-easterly corner of the South Residential Area.

Winds from the East (90 degrees)

Figure 7, “Impact Analysis ENM-Model Predicted Noise Levels for Winds from 90 degrees, 30 ft/s” shows the noise contours resulting from the wind turbines with a hub height of 300 feet above the ground. Turbine related noise for winds from the east, at 30 feet per second, will carry noise towards the residence in Section 27, T32S, R35E MDBM.

Northern Residential Area

Turbine noise from the east will carry noise towards the residential area in Section 27. The residential receptors will experience outside noise levels ranging from 45 dB(A) to 52 dB(A). The receptors in Section 27 will experience noise from the turbines in Sections 26 and 35 T32S, R35E.

Southern Residential Area

Winds from the south do not affect the South Residential Area sensitive receptors.

Winds from the South (180 degrees)

Figure 8, “Impact Analysis ENM-Model Predicted Noise Levels for Winds from 180 degrees, 17 ft/s” shows the noise contours resulting from the wind turbines with a hub height of 300 feet above the ground; however based on the review of local wind data the wind speeds aren’t expected to exceed 17 feet per second for more than 0.1% of the year (9 hours) during this condition. Therefore the modeled high wind condition was set at 17 feet per second. Turbine related noise for winds from the south will carry the noise towards the residential area in Section 27, T32S, R35E MDBM.

Northern Residential Area

The sensitive receptors in Section 27 will experience outside noise levels ranging from 46 dB(A) to 52 dB(A), **Figure 9**, “Impact Analysis ENM-Model Predicted Noise Levels for Winds 180 degrees, 17 ft/s Northern Sensitive Receptors.” The receptors will experience noise from turbines in Section 28, T32S, R35E MDBM.

Southern Residential Area

Winds from the south do not affect the South Residential Area sensitive receptors.

5.4.3 Summary: Audible Exterior Noise (A-weighted)

The modeling is performed on the basis that the sound power levels are the instantaneous noise levels for a specific wind turbine at a given wind speed in accordance with the standards. This sound power level is modeled as an instantaneous value, (L_0), but is treated throughout as the L_1 , L_8 , L_{50} or L_{eq} (modeling assumes no mal-distribution or skew of noise). This means that the model conservatively treats all noise as being generated at the maximum value at any given instant; therefore, the model actually predicts the L_0 . If this value which is developed for a specific wind direction and speed predicts that the noise level L_0 is below the threshold set forth by the County for $L_{8.3}$, then it stands to reason that it also meets the L_1 and $L_{8.3}$ (5 minute) requirement.

Per Kern County, “In the event the ambient noise level (exclusive of the development in question) exceeds one (1) of the standards given above, the applicable standard shall be adjusted so as to equal the ambient noise level. For audible noise, the ambient noise level shall be expressed in terms of the highest whole number sound pressure level in dBA[,] which is exceeded for no more than five (5) minutes per hour ($L_{8.3}$).” (As a practical matter the $L_{8.3}$ value may be referred herein as L_8 value).

The modeling results for the subject North Residential Area and South Residential Area were divided according to road segments. Summary audible impacts for the road segments in the

receptor areas are shown in **Tables 5.4-1** and **5.4-2** below. Any segment whose audible noise increment exceeds the thresholds are highlighted in red.

North Residential Area

The WTG location modeling results show one road segment in the North Residential Area experiencing audible impact above the threshold. The north segment of Homer Hansen's Private Road shows a modeled impact of 49 dBA and the threshold is 47dBA. However, there are no identified or potential residences on or near this segment.

The impacts are below the Kern County specified criteria and are considered *less than significant* for northern and southern Receptor Areas.

South Residential Area

Limited impacts in the northeast corner of the South Residential Area. However, with mitigation impacts to any sensitive receptor situated along the northern part of 60th Street or along the west-most segments of Rosewood, and Dagre should be *less than significant*.

Table 5.4-1: Audible Noise Impact Summary-North Residential Area

Road Segments	Rock House Road			Pony Express Road			Plute Pass East-West			Wild Flower Rd			Luna Dr.			Lera Ln.			Quail Canyon Rd.			Plute Pass North-South			Lief Rd.	Dove Dr.	West	Homer Hansen's Private Rd		
	West	Center	East	West	East	West	East	West	Center	North	South	Center	North	South	Center	North	South	Center	North	South	Center	North				South	Center	North		
Prevailing (Winds from 315 degrees at 30 feet per second)																														
	61	61	61	49	49	56	56	61	51	49	56	51	49	56	51	49	56	51	49	56	51	49	56	51	56	51	61	51	47	
Threshold, L8																														
Threshold, L1	65	65	65	53	53	60	60	65	55	53	60	55	53	60	55	53	60	55	53	60	55	53	60	55	60	55	65	55	51	
Modeled, L8	51	48	45	46	45	46	45	52	49	45	50	47	45	48	46	45	46	45	45	46	45	45	46	45	45	45	45	45	45	
Modeled, L1	51	48	45	46	46	46	45	52	49	45	50	47	45	48	46	46	46	45	45	45	46	47	47	45	45	45	45	45	45	
Winds from 90 degrees at 30 feet per second																														
	61	61	61	49	49	56	56	61	51	49	56	51	49	56	51	49	56	51	49	56	51	49	56	51	56	51	61	51	47	
Threshold, L8																														
Threshold, L1	65	65	65	53	53	60	60	65	55	53	60	55	53	60	55	53	60	55	53	60	55	53	60	55	60	55	65	55	51	
Modeled, L8	49	49	49	45	45	47	47	49	47	45	49	47	45	49	47	45	49	47	45	49	47	45	49	46	45	46	45	45	45	
Modeled, L1	49	49	49	45	45	47	47	49	47	45	49	47	45	49	47	45	49	47	45	49	47	45	49	46	45	46	45	45	45	
Winds from 180 degrees at 17 feet per second																														
	61	61	61	49	49	56	56	61	51	49	56	51	49	56	51	49	56	51	49	56	51	49	56	51	56	51	61	51	47	
Threshold, L8																														
Threshold, L1	65	65	65	53	53	60	60	65	55	53	60	55	53	60	55	53	60	55	53	60	55	53	60	55	60	55	65	55	51	
Modeled, L8	50	50	52	48	48	48	47	50	49	48	50	49	48	50	48	47	50	48	47	50	49	47	51	49	51	52	49	48	48	
Modeled, L1	50	50	52	48	48	48	48	50	49	48	50	49	48	50	48	47	50	48	47	50	49	47	51	49	51	52	49	48	48	

Table 5.4-2: Audible Noise Impact Summary- South Residential Area

Road Segments	Rosewood			Dagre			Center			Starlite			Arroyo			60th Street			50th Street West		
	West	Center	East	West	Center	East	West	Center	East	West	Center	East	West	Center	East	West	Center	East	West	Center	East
Prevailing (Winds from 315 degrees at 30 feet per second)																					
Threshold, L8	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Threshold, L1	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Modeled, L8	57	52	49	55	51	49	52	50	46	45	48	46	46	46	45	57	50	45	49	45	45
Modeled, L1	57	52	49	55	51	49	52	50	46	45	48	46	46	45	45	57	50	45	49	45	45
Winds from 90 degrees at 30 feet per second																					
Threshold, L8	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Threshold, L1	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Modeled, L8	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Modeled, L1	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Winds from 180 degrees at 17 feet per second																					
Threshold, L8	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Threshold, L1	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Modeled, L8	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Modeled, L1	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45

5.4.4 Mitigations

Possible Reduction of Turbine Size, Locations and Output

Large wind turbine facilities by their design require a large area to allow proper and efficient operation over a wide range of wind patterns. For modeling and analysis in a study of this type one has to consider any potential noise generating event, however unlikely. In the event the wind direction and speed is such that the noise level exceeds the 5-minute limit defined by L_8 then the facility has a potentially significant impact. In order to mitigate a potential and remote impact of this type, the developer is faced with curtailed operations and use of smaller, less efficient turbines. This is counter to the project developer's stated goals to maximize the availability of wind energy. The Department of Energy has issued analysis indicating the feasible need for optimal designs of wind park facilities.¹² Legislation has been passed for California promoting maximum use of renewable energy.¹³ These stated objectives to implement "maximum technologically feasible and cost-effective reductions in greenhouse gas emissions" are defined by AB 32. On June 1, 2005, recognizing and responding to dangers posed to California by climate change, Governor Schwarzenegger signed Executive Order # S-3-05.

The Executive Order established the following GHG emission reduction targets for California:

by 2010, reduce GHG emissions to 2000 levels;

by 2020, reduce GHG emissions to 1990 levels; and,

by 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 climate stabilization target in Executive Order S-3-05 sets the framework for an appropriate public policy response to the risks posed by climate change.

The wind turbine resource areas represent a valuable mitigation for the timely reduction of GHG. As such it will be essential to maximize the efficient use of the area without adverse impacts to the environment.

Suggested Operational Mitigations

The stated goals of AB 32, S-3-05 target activities that will maximize the utilization of the available wind resource area, forego the stated need for renewable energy, and lessen economic viability. However, to ensure mitigation of any potentially significant audible noise impacts, the following operational measures are proposed followed by a brief discussion of the benefit of the proposed mitigation:

¹² U.S. Department of Energy - Energy Efficiency and Renewable Energy, Wind and Hydropower Technologies Program - Wind Powering America, Cost Trends.

¹³ California Public Utility Commission Proceeding R0404026, Date Filed: April 22, 2004, SB2X

Noise-1: For those receptors areas that are affected by the wind turbines, the project developer shall obtain waivers and a noise easement from the affected property owners.

Refer to the requirements specified in Kern County Ordinance Chapter 19.64, "Wind Energy Combining District".

Noise-2: In the event the developer proposes to locate any turbine closer to the boundary than the locations defined for that section in this noise study, the developer shall provide a report showing that the proposed turbine and location does not increase the impacts in this study.

This measure is self-explanatory in so far as the study has considered the current proposed locations as specified in the project description. Any modifications to the project layout would dictate that the Kern County Planning Department either determines that the proposed location is administrative or does not alter the impacts.

Noise-3: In the event a complaint is filed and it is determined as part of the complaint response that (a) certain turbine(s) emit noise that is found to exceed the Kern County L₈ Standards for Wind Energy Combining District under certain wind regimes, then the developer may, after conferring with the County as part of the noise complaint resolution, adjust the specific turbine(s) control set points to lower the cutoff speed to avoid operation during those conditions of wind direction and speed where the specific turbine(s) are causing complaints.

This measure represents a practical means to allow expert analysis with consultation with the Kern County staff of a complaint concerning any specific unit or units that may under certain unique circumstance cause a noise related event which affects a receptor. Such analysis may make certain recommendations that have no effect on other turbines not situated in the area of the complaint.

The residual impacts after mitigation **Noise-1** through **Noise-3** will be *less than significant*.

Implementation of the mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

5.5 Low Frequency Noise from Wind Turbine Operations

"Low frequency noise or infrasound from wind turbine operations shall not be created which causes the exterior noise level to exceed the following limits when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library."

One-third Octave Bank Center Frequency (Hz)	Sound Pressure Level (dB)
2 to 1	70 (each band)
20	68
25	67
31.5	65
40	62
50	60
63	57
80	55
100	52
125	50

According to the American Wind Energy Association, "Low frequency noise is typically generated as part of a mechanical event that is relatively slow with high enough amplitude to transmit over sufficient distances. Such noise may be part of a series of higher frequency noises that are associated with other higher frequency component mechanical events (such as a warped shaft in a large diesel engine). Other low frequency impulses may be felt as a single event (such as an explosion or a sonic boom). In general, low frequency events are more likely to be felt as discrete impulses.

Because of the impulsive nature of the acoustic low-frequency energy being emitted, there is an interaction between the incident acoustic pulses and the resonances of the homes which serve to amplify the stimulus creating vibrations as well as redistributing the energy higher into the audible frequency region. Thus the annoyance is often connected with the periodic nature of the emitted sounds rather than the frequency of the acoustic energy...

*Impulsive noise generation is generally confined to turbines whose rotors operate downwind of the support tower (downwind machine). In this case, impulses are generated by the interaction of the aerodynamic lift created on the rotor blades and the wake vortices being shed from the tower elements. Turbines that have their rotors upstream of the tower, except in very rare circumstances, do not generate impulses since there is nothing blocking the flow upwind of the rotor. The low-frequency noise generated from an upwind turbine is primarily the result of the interaction of the aerodynamic lift on the blades and the atmospheric turbulence in the wind. Because atmospheric turbulence is a random phenomenon, the radiated low-frequency noise also exhibits a random or non-coherent characteristic. Impulsive noise generated by the tower wake/rotor interaction, on the other hand, tends to be much less random or coherent and therefore much more detectable when it interacts with an intervening resonant structure."*¹⁴

Infrasound is generally associated with wind turbines where the blades pass downwind of the tower. In this design and operation the wind passes tower before blades, the sudden change in aerodynamics as blades pass behind the tower create a tower shadow at a low frequency. Currently, modern utility-scale wind turbines do not employ downwind rotors. Whereas, upwind rotors emit broad band noise emissions, including low frequency sound and infrasound, however, the sound is amplitude modulation at blade passing frequencies of higher frequency blade tip turbulence and does not contain low frequencies. Furthermore, this effect diminishes with

¹⁴ <http://www.awea.org/faq/noise-lf.html>

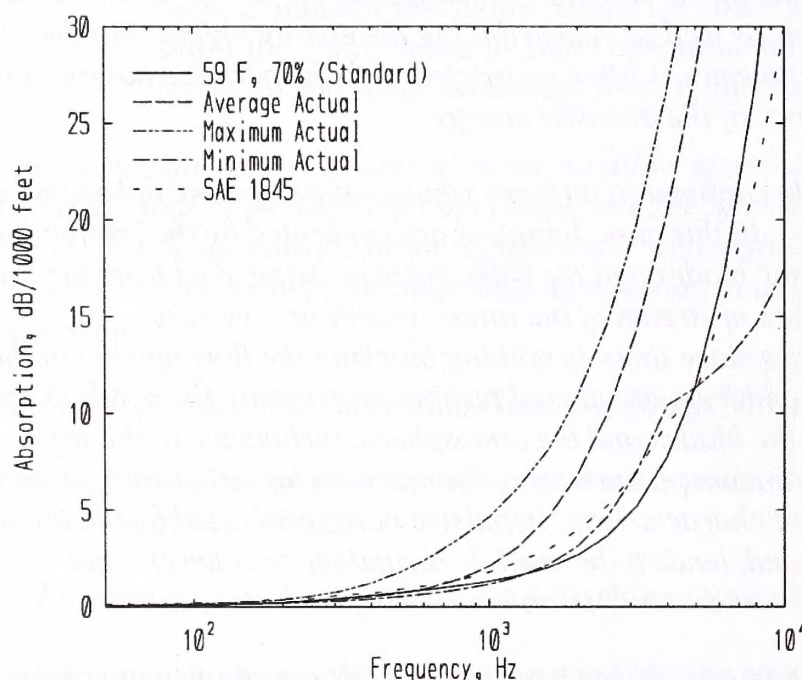
distance and blurs with multiple turbines.¹⁵ The strongest noise is generated at the blade passing frequency and harmonics.

Our sensitivity or ‘hearing’ normally registers frequencies between upper and lower levels of 20,000 Hz and 20 Hz. This is often referred to as the audio frequency range although sound as low as, or lower than, 2 Hz is capable of being heard by some humans.

Frequencies above 20,000 Hz are named ultrasonic or ultrasound and below 16 Hz are called infrasonic or infrasound, although sometimes the 20 Hz level is used for convenience. Infrasound, which is usually considered to be below the range of normal human hearing (20 Hz), is nevertheless still heard but is not interpreted as being heard even if the vibrations are felt elsewhere on the body.

Low frequency noise and infrasound are not as attenuated by molecular interactions as audible range noise.

“Similar factors influence the propagation of low frequency noise to those which influence infrasound. However, because of the higher frequencies, air and other attenuations are greater for low frequency noise than for infrasound and more is known about them. Typical air attenuations at 59 °F and 70% relative humidity are:¹⁶



The higher attenuation of higher frequencies makes correlation for air attenuation difficult for higher frequencies since the far-field noise measured for these frequencies is heavily biased by background due the extreme attenuation of the source noise. The stronger mid-range noise levels

¹⁵ http://www.windpoweringamerica.gov/pdfs/workshops/mwwg_turbine_noise.pdf

¹⁶ Plotkin, Kenneth J, Analysis of Acoustic Modeling and Sound Propagation in Aircraft Noise Prediction, NASA/CR-2006-214503, ch3.

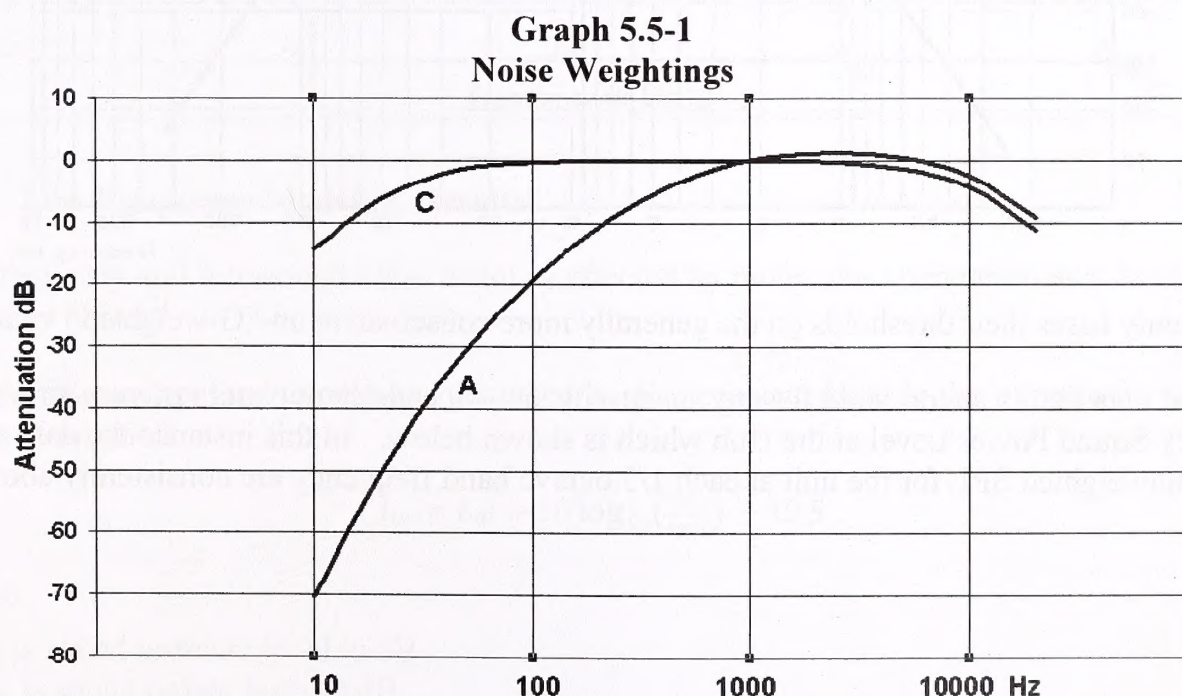
are sufficiently higher than the background to develop a reliable correlation which should be extrapolated to replace the high frequency data. Although the low frequency field measurements show a stronger noise value attributed to the source than background, the attenuation is a small fraction of a dB/1000ft.

At closer distances wind effect is also lower for the lower frequency as opposed to the higher frequency range. Wind effect was conservatively assumed to be 2dB for low frequencies. The Audible range noise was estimated by running a no wind and a 30 fps case for the 30fps noise source. The results showed approximately 8dB difference. The correction conservatively ranged from 1 dB (for lower audible band) to 10 dB (for higher audible bands) centered around 5 dB(A).

In addition to these there is reduction of 6 dB per doubling of distance due to radiative attenuation (spreading out of the wave) and any reduction which might occur due to absorption over the ground or by shielding. It is seen that air attenuations are a small contributor to losses at low frequencies but, since attenuation increase rapidly as frequency rises, air attenuation can be a main contributor at much higher frequencies in the kilohertz range. As a result, noise which has travelled over long distances is normally biased towards the low frequencies.”¹⁷

Prior studies have established that the uncorrected Sound Power emanating at frequencies from 1 to 125 dB are substantially higher than the dB(A) corrections that disallow the effect of human perception.^{18,19}

The graph (**Graph 5.5-1**) below shows the general curve addressing both C and A weightings.



For environmental noise it is normal to use the sound level meter A-weighting, which gradually reduces the significance of frequencies below 1000 Hz, until at 10 Hz the attenuation is 70 dB.

¹⁷ Leventhall, G, et al., A Review of Published Research on Low Frequency Noise and its Effects, Defra, 2003

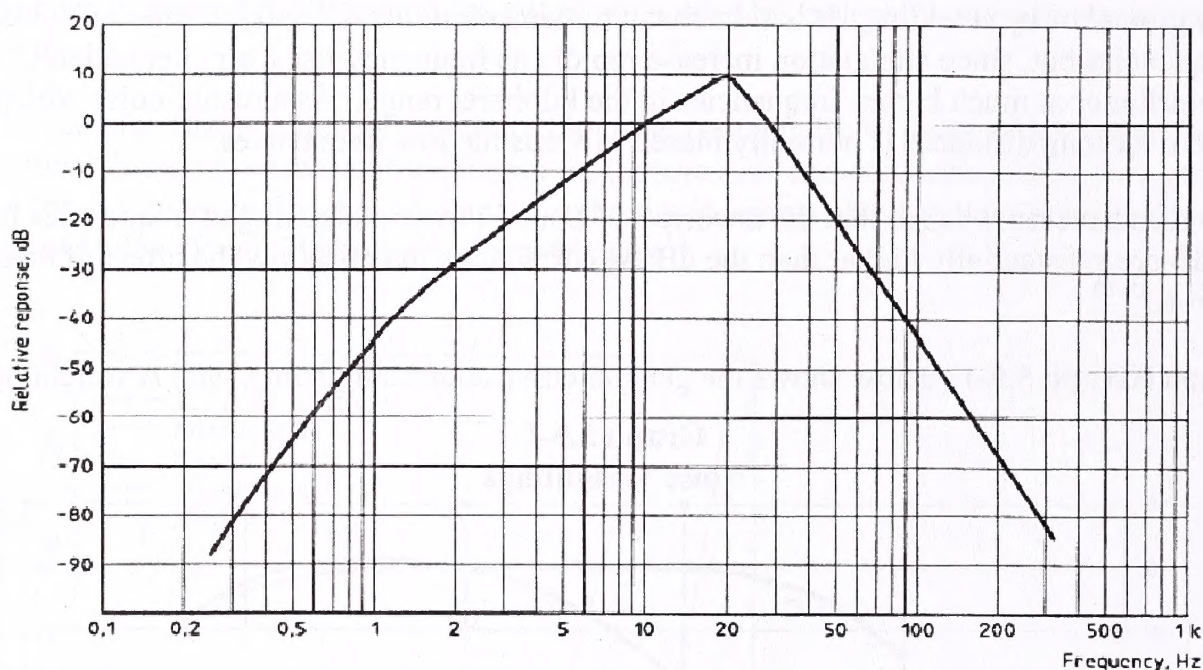
¹⁸ The range of A-weighting stops at 10 Hz.

¹⁹ http://www.windpoweringamerica.gov/pdfs/workshops/mwwg_turbine_noise.pdf

The G-weighting, (ISO7196, 1995), specifically designed for infrasound, falls off rapidly above 20 Hz, whilst below 20 Hz it follows assumed hearing contours with a slope of 12 dB per octave down to 2 Hz. This slope is intended to give a subjective assessment to noise in the infrasonic range. A G-weighted level of 95 – 100 dBG is close to the perception level. G-weighted levels below 85 - 90 dBG are not normally significant for human perception. However, too much reliance on the G-weighting, which is of limited application, may divert attention from problems at higher frequencies, say, in the 30 Hz to 80 Hz range.²⁰

The graph (**Graph-5.5-2**) below shows the G-weighting which is skewed towards 20 Hz by adding 10 dB to the 20 Hz reading and reduces all other low frequency noise levels.

Graph 5.5-2
G-Weighting for Low Frequency Noise

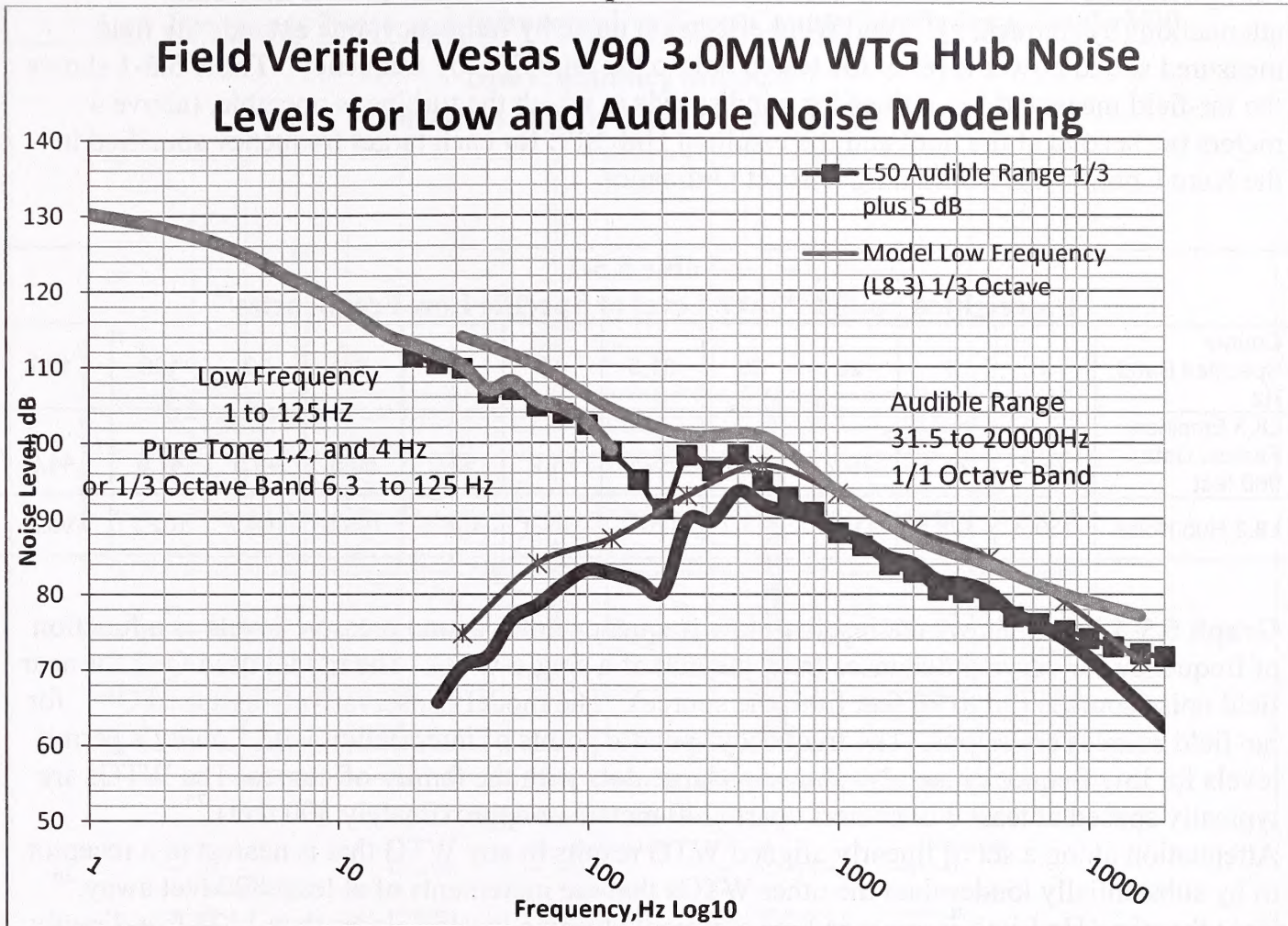


Kern County bases their thresholds on the generally more conservative un-“G-weighted” value.

Measured data that is uncorrected for any sensitivity show a consistent pattern of very strong low frequency Sound Power Level at the Hub which is shown below. In this instance the data show that the unweighted SPL for the unit at each 1/3 octave band frequency are consistently above 100 dB.

²⁰ Leventhall, G, et al., A Review of Published Research on Low Frequency Noise and its Effects, Defra, 2003

Graph 5.5-3



5.5.1 Low Frequency Modeling Results

Low frequency and infrasound noise is not as affected by molecular attenuation as is high frequency noise.²¹

The low frequencies tend to only be attenuated by distance according to the formula for radiative energy dissipation:

$$L_p = L_w + 10 \log_{10} \left(\frac{Q}{4\pi r^2} \right) + 10.5$$

Where:

L_p is sound pressure level in dB

L_w is sound power level in dB

Q is the directivity factor, 1 for spherical emissions, 2 for reflecting emissions

" r " is the distance from source in feet.

²¹ Plotkin, Kenneth J, Analysis of Acoustic Modeling and Sound Propagation in Aircraft Noise Prediction, NASA/CR-2006-214503, ch3.

Using available $L_{8.3}$ noise source data gathered from a V90 turbine²², lower molecular attenuation (by frequency)²³, and wind effects on noise by frequency, one extends the field measured sound power level of the tested unit to the Hub SPL by frequency. **Table 5.5-1** shows the far-field measured $L_{8.3}$ values for wind speeds at which the turbine is operable, (above 4 meters per second at the hub) and the resultant Hub SPL for each target frequency specified in the Kern County WE Combining District Ordinance.

Table 5.5-1
Unweighted Sound Power Level at Specific Low Frequencies²⁴

County Specified Band, Hz	1	2	20	25	31.5	40	50	63	80	100	125
L8.3 Empirical Farfield Data, 960 feet	75.2	73.3	70.2	56.6	55.1	51.9	53.0	50.5	49.5	47.6	44.0
L8.3 Hub Noise	130.3	128.5	113.0	111.7	110.3	107.1	108.1	105.6	104.7	102.7	99.2

Graph 5.5-4 below shows the resultant low frequency noise sound pressure levels as a function of frequency for varying distances from the hub of a single WTG. The model used $Q=2$ for near field noise sources (30 to 90 feet from the source). The model conservatively assumed $Q=1$, for far-field sources emissions. The frequency specific points of intersection with County's permit levels for low frequency are also shown as large dots with the family-of-curves. The WTGs are typically spaced at least 3 diameters apart (240 meters or approximately 800 feet).²⁵ Attenuation along a set of linearly aligned WTG results in any WTG that is nearest to a receptor to be substantially louder than the other WTGs that are increments of at least 800 feet away.²⁶ Note that the 1Hz Limit is exceeded for any single turbine located closer than 1425 feet directly downwind, therefore the 1Hz limit is the low frequency critical criterion for proximity of a single WTG or units in a row that are in-line with a residential receptor.

²² See Time Stamped Spectral and Anemometer Data for Vestas V90 WTG, **Attachment 5**

The low frequency Hub SPL based on the field data gathered from far-field measurements of a Vestas V90 turbine at 954 feet was back calculated for the recorded frequencies using: attenuation, wind effect, radiative formulae to determine a sound power level for frequencies below 125 Hz. Data for 6.3 to 31.5 Hz were extrapolated to provide the 1, 2 and 4 HZ band.

²³ Rogers, A.L., Wind Turbine Noise, Infrasound and Noise Perception Renewable Energy Research Laboratory University of Massachusetts at Amherst, 2006

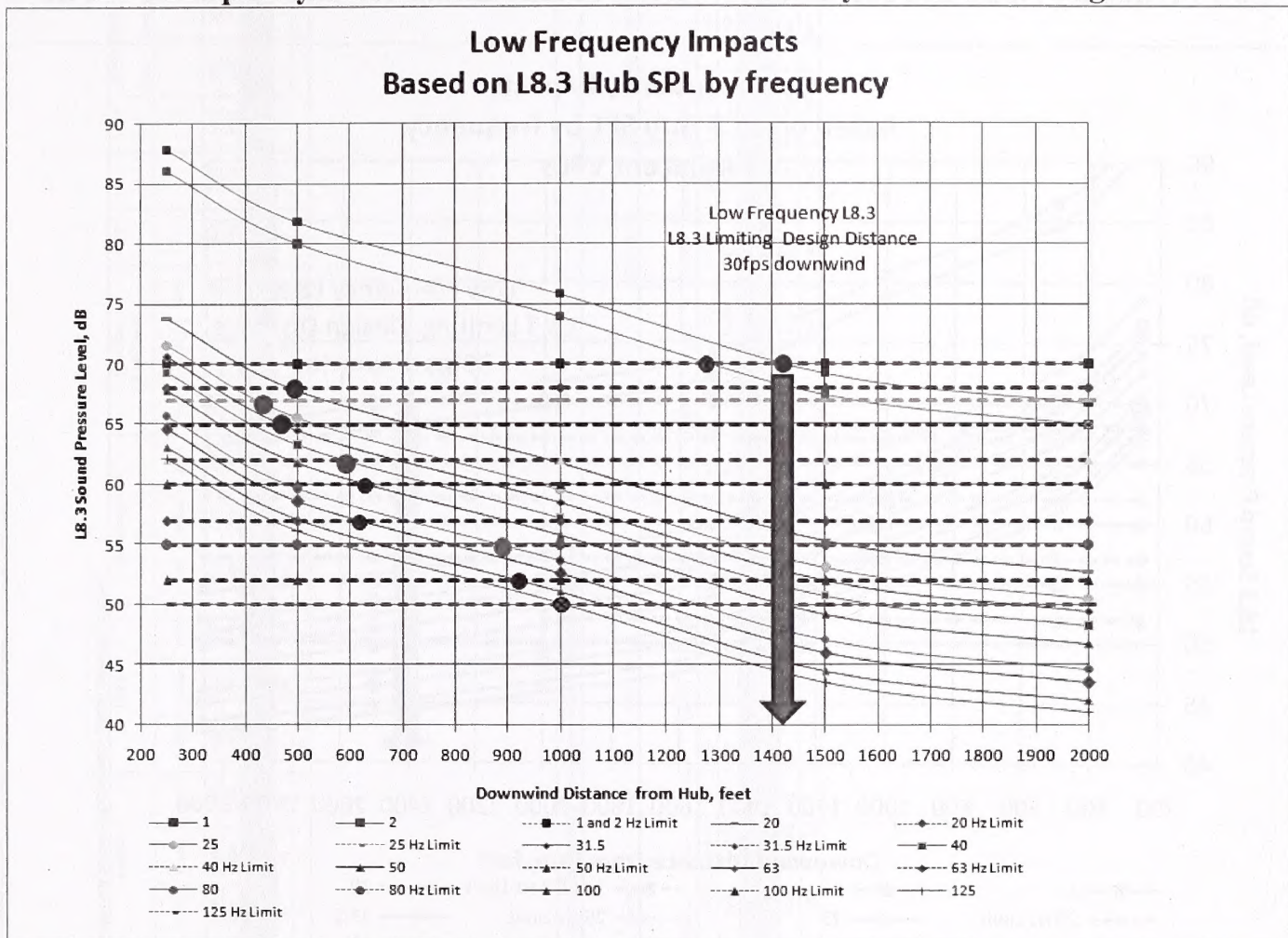
http://www2.mst.dk/common/Udgivramme/Frame.asp?http://www2.mst.dk/udgiv/publications/2005/87-7614-687-1/html/helepubl_eng.htm

²⁴ Values are at 1/3 octave band .

²⁵ Vestas 3.0 MW General Specification, **Attachment 4**

²⁶ The next nearest WTG could be approximately 2000 feet from a receptor situated in-line with several WTGs (1400feet plus an additional 800feet). At these relative distances the farther WTG would be 5 dB lower in SPL than the nearer. Algebraically adding two values, one of which is 5 dB(A) lower than the other results in an increase of less than 1dB(A) in the higher value.

Graph 5.5-4
Low Frequency Noise and Infrasound vs Kern County Limits for a Single V90



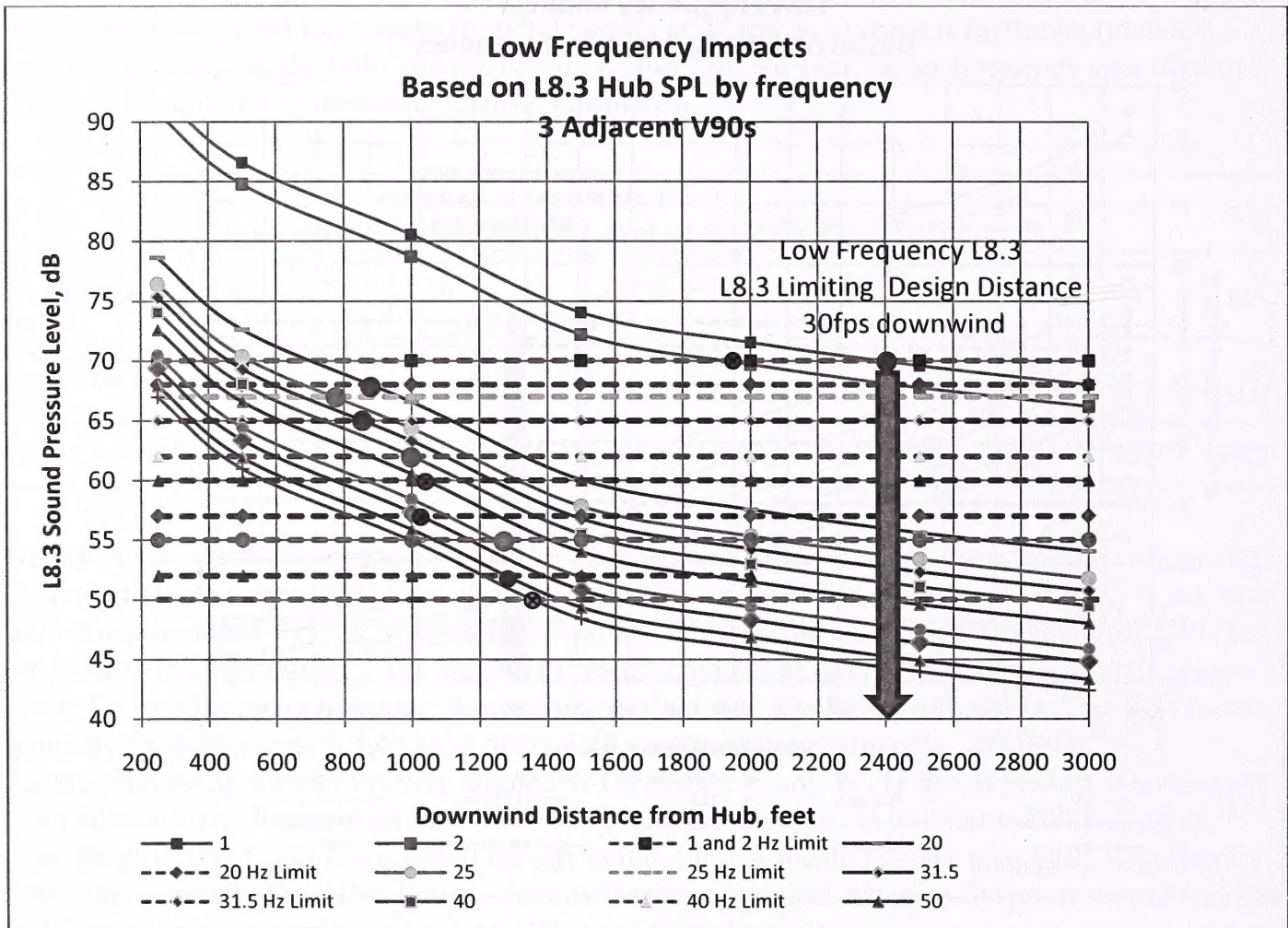
Graph 5.5-5 below shows the resultant low frequency noise sound pressure levels as a function of frequency for varying distances from the hub of three WTGs arranged perpendicular to wind direction. The model used $Q=2$ for near field noise sources (30 to 90 feet from the source). The model conservatively assumed $Q=1$, for far-field sources emissions. The frequency specific points of intersection with County's permit levels for low frequency are also shown as large dots with the family-of-curves. The WTGs are typically spaced at least 3 diameters apart (240 meters or approximately 800 feet).²⁷ Attenuation equidistant from a adjacent to a set of linearly aligned WTG results in all WTGs contributing an approximate equivalent Sound Pressure Level to a receptor.²⁸ Note that the 1Hz Limit is exceeded for any single turbine located closer than 2400 feet directly downwind, therefore the 1Hz limit is the low frequency critical criterion for proximity of multiple WTGs whose position paces them directly adjacent and equidistant to the to residential receptor.

²⁷ Vestas 3.0 MW General Specification, **Attachment 4**

²⁸ The three WTGs could be approximately situated on a relatively equidistant radius of at least 1400 feet from a receptor situated adjacent to several WTGs. At 1400 feet each WTG impact is 70dB. Algebraically adding three 70 dB values, results in 75dB at the receptor.

Graph 5.5-5

Low Frequency Noise and Infrasound vs Kern County Limits for three adjacent WTGs



There are no residential receptors in the proposed project area that meets this conservative screening criterion.

5.5.2 Summary: Low Frequency Noise

The results show that for frequencies below 125 Hz the impact due to infrasound is not significant at a distance beyond 1425 feet downwind from any single wind turbine and 2400 feet downwind from any groups of turbines that are arranged tangentially to the prevailing wind direction.

Southern Residential Area

The results show that for frequencies below 125 Hz the impact due to infrasound is not significant at a distance beyond 1425 feet downwind from the wind turbines.

Table 5.5-2 Low Frequency Screening Distance- North Residential Area

Road Segments	Rock House Road			Pony Express Road			Plute Pass East-West			Wild Flower Rd			Luna Dr.			Lera Ln.			Quail Canyon Rd.			Plute Pass North-South			Lief Rd.	Pinon Tr	West	Homer Hansen's Private Rd		
	West	Center	East	West	Center	East	West	Center	East	South	Center	North	South	Center	North	South	Center	North	South	Center	North	South	Center	North				South	Center	North
Threshold single WTG >1400 feet	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
Threshold multiple WTGs >2400 feet	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
Screening Distance >1400 feet	2000	2700	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Screening Distance >2400 feet	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
WTG Location	W	W	SE	W	W	SE	W	W	SE	W	W	W	W	W	W	W	W	W	W	W	W	SE	SE	SE	SE	SE	SE	SE	SE	SE
Single WTG (S) or Multiple (M)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S

Table 5.5-3 Low Frequency Screening Distance-South Residential Area

Road Segments	Rosewood			Dagre			Center			Starlite			Arroyo			60th Street			50th Street West		
	West	Center	East	West	Center	East	West	Center	East	West	Center	East	West	Center	East	South	Center	North	South	Center	North
Threshold single WTG >1400 feet	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
Threshold multiple WTGs >2400 feet	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
Screening Distance >1400 feet	3000	5625	7800	3750	5850	8200	4700	6700	8750	5800	7500	9375	3000	8500	10000	7000	5000	2800	10000	8750	8000
Screening Distance >2400 feet	3000	5625	7800	3750	5850	8200	4700	6700	8750	5800	7500	9375	3000	8500	10000	7000	5000	2800	10000	8750	8000
WTG Location	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
Single WTG (S) or Multiple (M)	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

5.6 Pure Tones

5.6.1 Pure Tone Discussion

Per the Kern County Zoning Ordinance Wind Energy Combining District, Chapter 19.64, in the event audible noise due to wind turbine operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by five (5) dBA. A pure tone is defined to exist if the one-third (1/3) octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two (2) contiguous one-third (1/3) octave bands by five (5) dBA for center frequencies of five hundred (500) Hz and above, by eight (8) dBA for center frequencies between one hundred sixty (160) Hz and four hundred (400) Hz, or by fifteen (15) dBA for center frequencies less than or equal to one hundred and twenty-five (125) Hz.

Mechanical noise originates from the relative motion of mechanical components and the dynamic response among them.

Since the emitted sound is associated with the rotation of mechanical and electrical equipment, it tends to be tonal (of a common frequency), although it may have a broadband component. For example, pure tones can be emitted at the rotational frequencies of shafts and generators, and the meshing frequencies of the gears.

Historic data gathered for a variety of modern large scale wind turbine generators has shown the absence of pure tone noises resulting from operations over a wide range of wind regimes.²⁹

5.6.2 Pure Tone Analysis

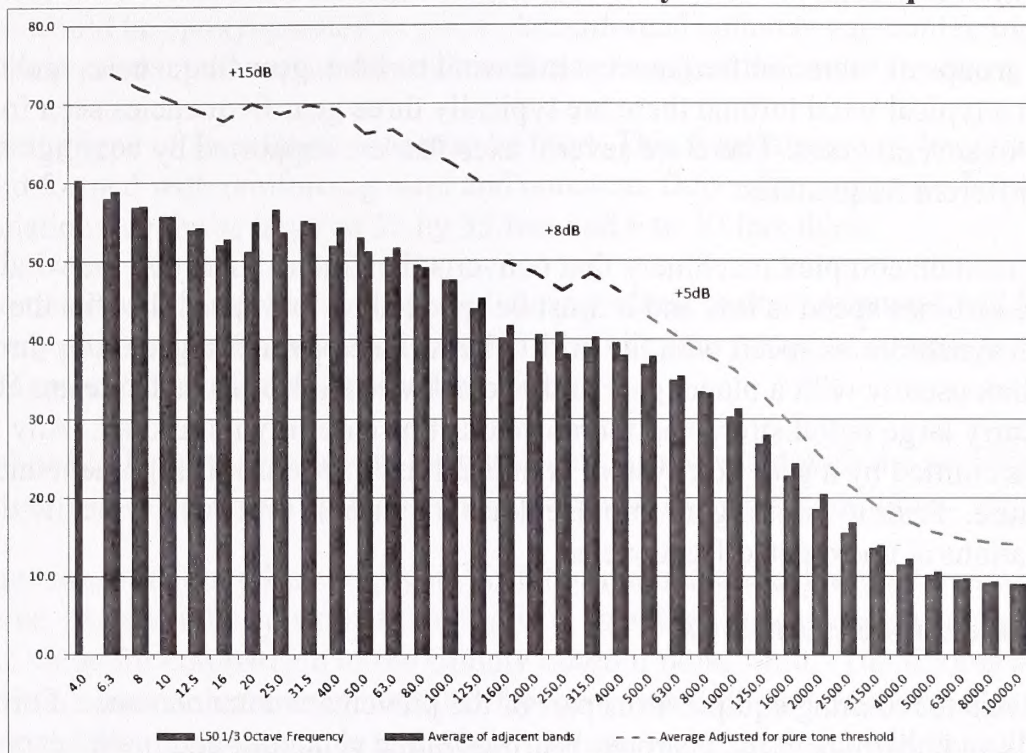
The Vestas 3.0 MW L_{8.3} based data were plotted and tested against the County's pure tone requirements. **Graph 5.6-1** below shows the resultant 1/3 frequency bands and the average of the two adjacent bands. The average of the two 1/3 octave bands that are directly adjacent were calculated using the general averaging equation:

$$L_{avg} = 10 \times \log_{10} \left[\sum_{i=1}^n 10^{(dBi/10)} \right]$$

The not-to-exceed values of 15 dB (125 HZ or less), 8 dB (160 Hz to 400 Hz) and 5 dB (500 Hz or greater) were added. The dotted line represents the limit for defining any pure tones relative to the turbine noise profile.

²⁹ www.ccere.org/rerl

Graph 5.6-1
Vestas 3.0 MW Wind Turbine vs Kern County Pure Tone Requirements



As can be seen no specific 1/3 sound power level individually exceeds the arithmetic average of the two adjacent noise levels by the specified range, therefore there are no pure tones for the Vestas 3.0 MW wind turbine.

5.7 Repetitive Impulse Sounds

5.7.1 Repetitive Impulses Discussion

In the event the audible noise due to wind turbine operations contains repetitive impulsive sounds, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by five (5) dB(A).³⁰

*Impulsive noise generation is generally confined to turbines whose rotors operate downwind of the support tower (downwind machine). In this case, impulses are generated by the interaction of the aerodynamic lift created on the rotor blades and the wake vortices being shed from the tower elements. Turbines that have their rotors upstream of the tower, except in very rare circumstances, do not generate impulses since there is nothing blocking the flow upwind of the rotor.*³¹

The subject turbines are upwind units.

³⁰ Kern County Zoning Ordinance Wind Energy Combining District, Chapter 19.64

³¹ <http://www.awea.org/faq/noise-lf.html>

Certain noises can have a reverberation effect in the tower portion of the turbine that amplifies the noise (Helmholtz effect).

There are two groups of vibration frequencies in a wind turbine, gear frequencies and bearing frequencies. In a typical wind turbine there are typically three gear frequencies seen from measurements of several gears. There are several axes that are supported by bearings that produce four different frequencies.

Wind turbines contain complex machinery that converts the kinetic energy in the wind into electricity. The turbines speed is low and it must be speeded up to a speed that fits the generator that operates in synchronous speed with the grid. The turbine operates a generator through a speeding gearbox usually with a planet gear and one or two parallel gears. There are also several bearings that carry large radial stress and therefore must be carefully monitored. Any repetitive impulse sounds emitted by a gear box system is indicative of serious misalignment and impending failure. Prior to emitting an impulse noise the turbine units will typically demonstrate abnormal vibrations at unexpected frequencies.

5.7.2 Repetitive Impulses Analysis

Vibration analysis for rotating equipment is part of the preventative maintenance. For wind turbines wheels and bearings in the gearbox, bearings in the generator and main bearing can be monitored to prevent mechanical events that may create impulse noise in the audible range.³²

There are no expected audible impulse noises from a normally operating unit.

5.8 Construction Noise

5.8.1 Construction Noise Discussion

Wind Turbine Foundations and Pad Areas

The WTG foundations would have one of three designs, depending on geotechnical constraints and other factors, including wind patterns at the site, site access, and material availability. The three possible types of WTG foundations are (1) Patrick and Henderson Inc. (P&H) patented post-tensioned foundation, (2) rock anchor, or (3) a modified spread-footing.

The P&H foundation would be drilled or dug to approximately 15 to 35 feet deep, depending on geotechnical conditions and loadings, and would be approximately 18 feet in diameter. The foundation would be in the configuration of an annulus—two concentric steel cylinders. The central core of the smaller, inner cylinder would be filled with soil removed during excavation. In the cavity between the rings, bolts would be used to anchor the tower to the foundation, and the cavity would be filled with concrete. Bolting the tower to the foundation would provide post-tensioning to the concrete.

³² Robb, D. and Harrison, L., Who supplies to whom -wind industry gearboxes and bearings, Wind power monthly, November 2005

A rock anchor-type foundation is an alternative to the P&H foundation. Six to 20 holes, depending on geotechnical data, would be drilled approximately 35 feet into the bedrock, and steel anchors would be epoxy-grouted in place. A reinforced concrete cap containing the anchor bolts would be poured on the top of the steel anchors to support the tower structure.

A spread-footing type of foundation also may be used. This foundation may be square or octagonal and formed with reinforcing steel and concrete. Depending on geotechnical data, this type of foundation may be as large as 35 by 35 feet and 6 to 10 feet thick.

Construction noise was modeled for the period during which major equipment will be located at the site. At any given time it is assumed that there will be four major noise sources operating, **Exhibit 2**, "Typical Source Data Construction Noise."

Figures 10 thru 12 show noise contours for construction associated with the activity at the wind turbine location nearest to the closest residence under varying wind conditions.

In general any construction noise complying with normal operational mitigations will occur during daytime. As such the adjustment for L_{dn} is 0, therefore the calculated noise values are treated as the value for comparison to the County outdoor noise limit. The figures below show that the 65 dB(A) contour extends up to 3,000 feet downwind of the construction activity depending on terrain. It is reasonable to assume that any residential site within 3,000 feet of a proposed turbine location will experience daytime construction noise in excess of the County limit.

The Project will likely be constructed in multiple phases because of Project scale, WTG availability and Project economics. WTG commitments are under Applicant review. Phased construction procedures will require close coordination with Kern County.

There will be two types of roads required for the Project: temporary roads used during construction to access areas within the Project site, and permanent roads used during operations to access Project facilities. The Project road network will have a larger footprint during construction because of the size of the equipment - especially the cranes required to erect the WTGs and the low boy trailers required to bring the nacelle, blades, tower and transformers to the site. Some of these roads may be removed and restored after initial construction, some may be reduced in size, and others may be maintained at their construction size for the life of the Project to allow for crane usage during operations and maintenance.

5.8.2 Construction Noise Impacts

The unmitigated construction impacts are considered potentially significant for the duration of the construction within 3,000 feet adjacent to a residence.

Implementation of the following mitigation measures would ensure that the potential impacts are reduced to *less than significant* levels.

5.8.3 Construction Noise Mitigations

Noise -4: The applicant shall limit noise-generating activities to the following hours: between 5:30 a.m. and as late as 9:00 p.m. Monday through Saturday. If required to meet critical schedule milestones, construction may also occur between 7:00 a.m. and 6:00 p.m. on Sundays.

Daytime noise levels do not present a problem in the general area. Most receptors are accustomed to the daytime noise levels associated with the wind park operations.

Noise – 5: The applicant shall cover equipment engines and ensure that mufflers are in good working conditions.

Proper design of noise reducing elements in construction can serve to reduce sound power levels by 10 to 20 dB(A).

Noise – 6: The applicant shall locate all stationary equipment such as compressors and welding machines away from noise receptors to the extent practicable.

Specific turbine locations that show potential construction impacts may be adjusted or eliminated; however, the wind regime will make it difficult to completely remove the “potential” for impacts from the general area without mitigations

Construction impacts can be mitigated by relocation of sites close to a sensitive receptor, limiting the time of noise generating construction activity to daylight hours and using proper sound control measures on the construction equipment.

Relocation issues are addressed as part of the discussion of audible impacts.

Level of Significance after Mitigation

Impacts would be *less than significant*.

5.9 Vibration Impacts

There are three primary types of receivers that can be adversely affected by ground vibration: people, structures, and equipment.

Ground vibration can be annoying to people. The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential.

For this analysis, vibratory motion is described by identifying the peak particle velocity (PPV).

Human Response to Transient Vibration	
PPV (in/sec)	Human Response
2.0	Severe
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible

Pile Driving

A wide variety of impact and vibratory pile driving hammers is used for driving or extracting various types of piles. Commonly used types of pile drivers are the: Drop hammer, Pneumatic hammer, Diesel hammer, Hydraulic hammer, and Vibratory pile driver. The rated energies of most pile drivers are in the range of about 20,000–300,000 foot-pounds (ftlbs.)

This analysis uses a 36,000 ft-lb pile driver. The amplitude (PPV) for a 36,000ft-lb pile driver at 25 feet is 0.65 in/sec. The amplitude diminishes by $(25/\text{distance in feet})^{1.1}$. Therefore the PPV amplitude at 100 feet would be 0.14in/sec, at 300 feet it would 0.0422 in/sec and at 500 feet it would be 0.024in/sec.

The limit of perceptibility (0.035in/sec) would be approximately 400 feet from a pile driver.

Construction Equipment

Sources of construction equipment which may create vibration are listed in the table below.

Vibration Source Amplitudes for Construction Equipment			
Equipment	Reference PPV at 25 feet (in/sec)	Estimated PPV at 100 feet (in/sec)	Estimated PPV at 400 feet (in/sec)
Large bulldozer	0.089	0.02	0.0042
Caisson drilling	0.089	0.02	0.0042
Loaded trucks	0.076	0.017	0.0036
Jackhammer	0.035	0.008	0.0016
Small bulldozer	0.003	0.0007	0.0001

The limit of perceptibility for the large bulldozer and Caisson drilling would be less than 100 feet.

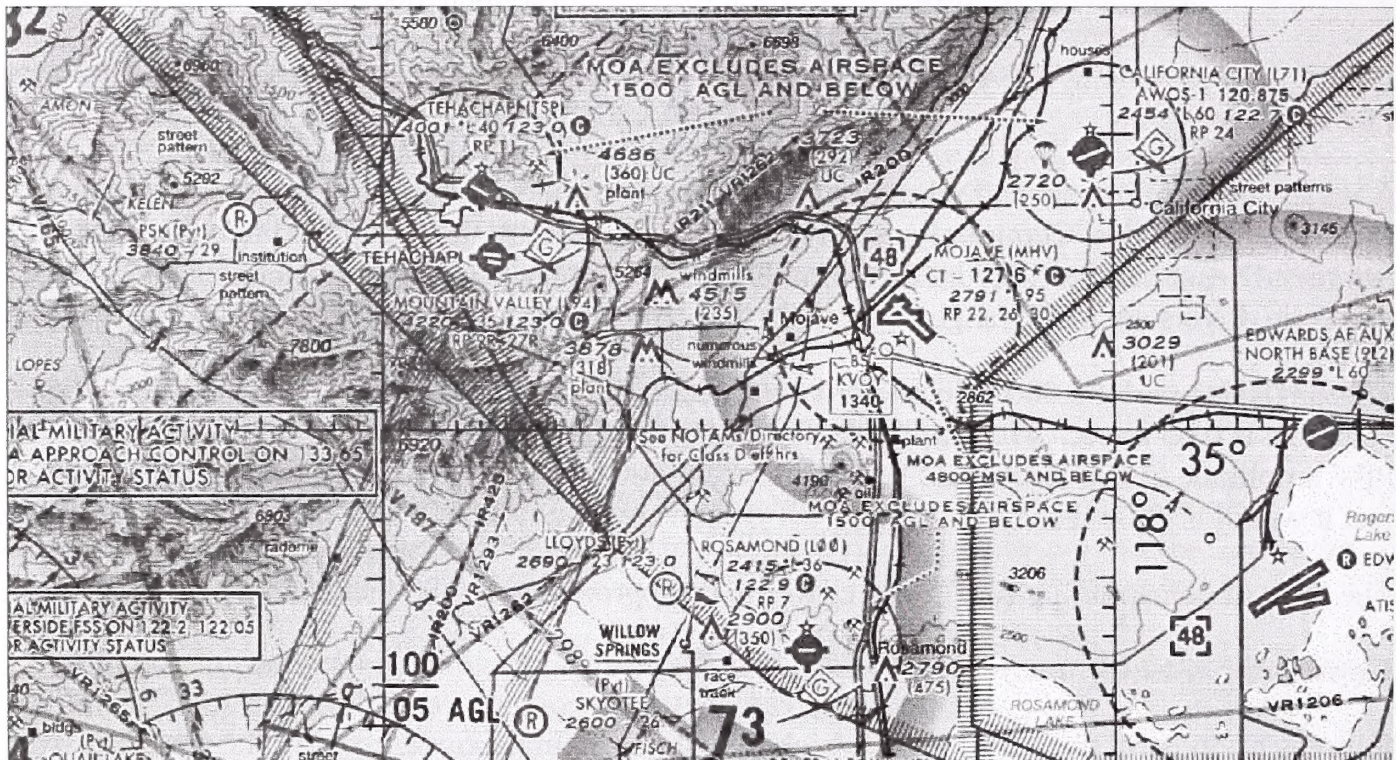
Therefore, the Vibration Impacts are *less than significant*.

5.9.1 Vibration Mitigations

Although no vibration mitigations are required, the measures that are provided to mitigate Construction Impacts will also act to reduce the vibration related impacts.

5.10 Airstrip Related Impacts

A review of the FAA sectional chart (see excerpt below) of the area indicates that there are (4) publically accessible operating air fields (TSP, L94, L00 and MHV), (1) military operation (EDW). There is one private airfield Lloyds to the south of the project. The project underlies two Military Operating Areas (Bakersfield MOA and Isabella MOA).



These operations currently operate in concert with existing wind parks in the same area as the proposed project. There are no airport planning areas that are in conflict. Therefore there are no impacts.

5.10.1 Airstrip Related Mitigations

None.

Temporary construction roads will make use of the permanent site roads along the WTG rows by temporarily widening these roads to approximately 36 feet. These traffic ways will be engineered and compacted to carry the weight of heavy cranes and delivery vehicles. Following completion of construction, the temporary part of these roads will be disked and re-vegetated, leaving approximately 20-foot wide permanent site roads.

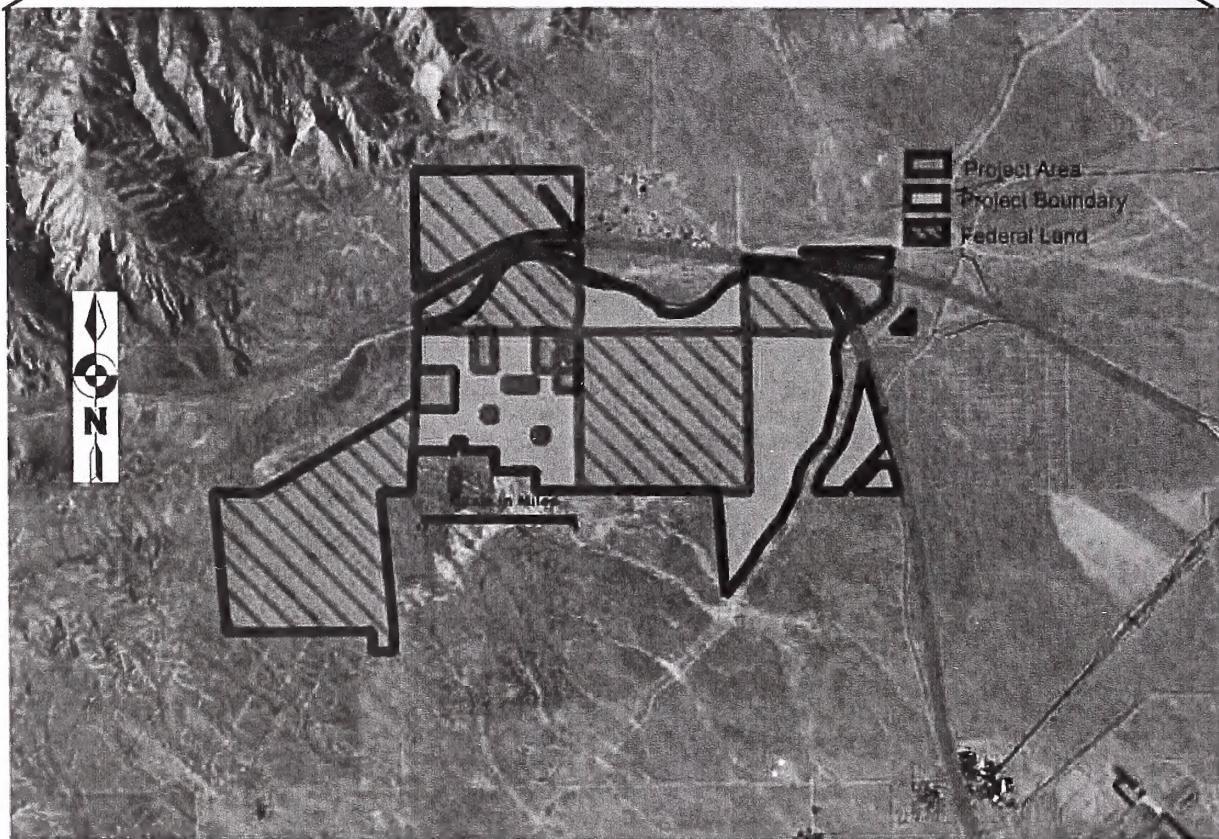
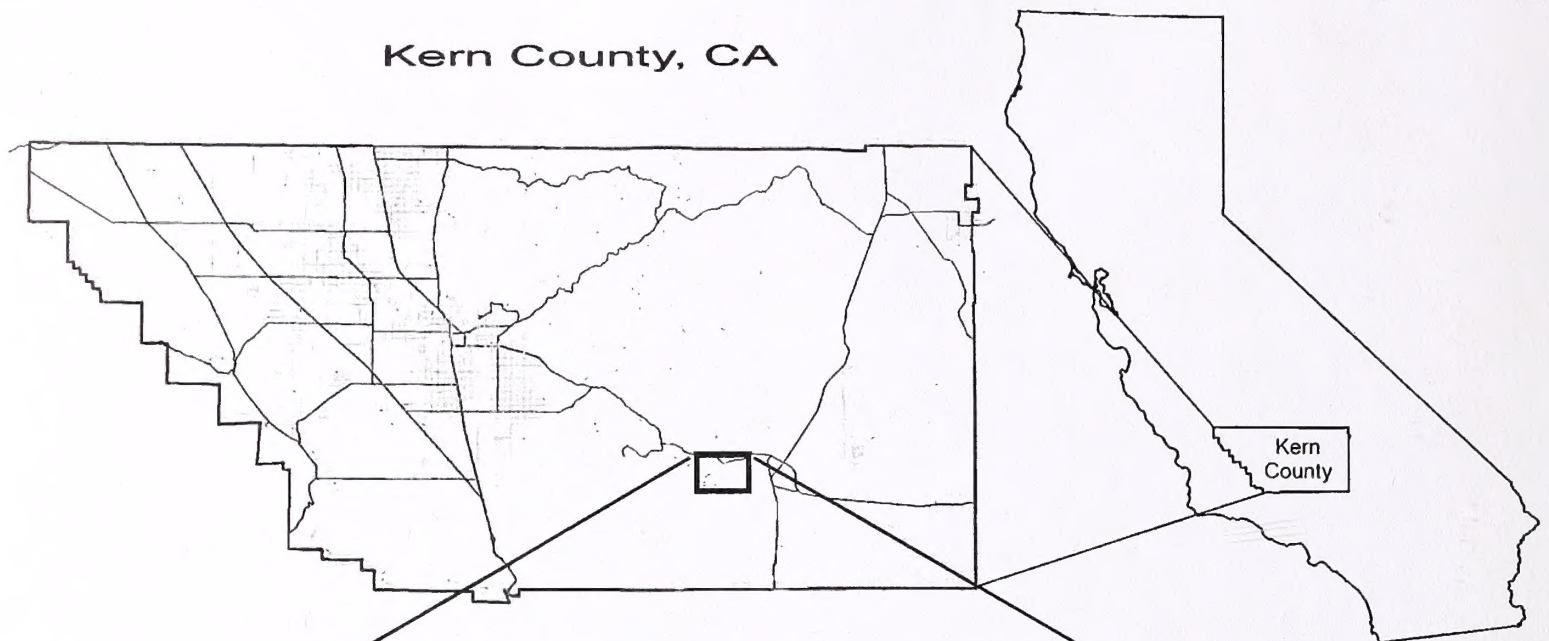
Existing roads will be utilized where possible, and to the extent necessary, existing roads will be upgraded. New roads will be constructed using graders, bulldozers and compactors. Construction of new roads will begin with rough grading and leveling. Next, the base of the road will be constructed using compacted local materials or imported gravel base materials, as necessary, to assure compliance with design and code requirements. All roads will be maintained as necessary throughout the construction and operation periods.

6 REFERENCES

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- ANSI S12.18-1994 Procedures for Outdoor Measurement of Sound Pressure Levels
- ASTM E1014-84 Standard Guide for Measurement of Outdoor A-Weighted Sound Level
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- IEC 61400-11 Wind Turbine Generator Systems –Part 11: Acoustic Noise Measurement Techniques
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FIGURES

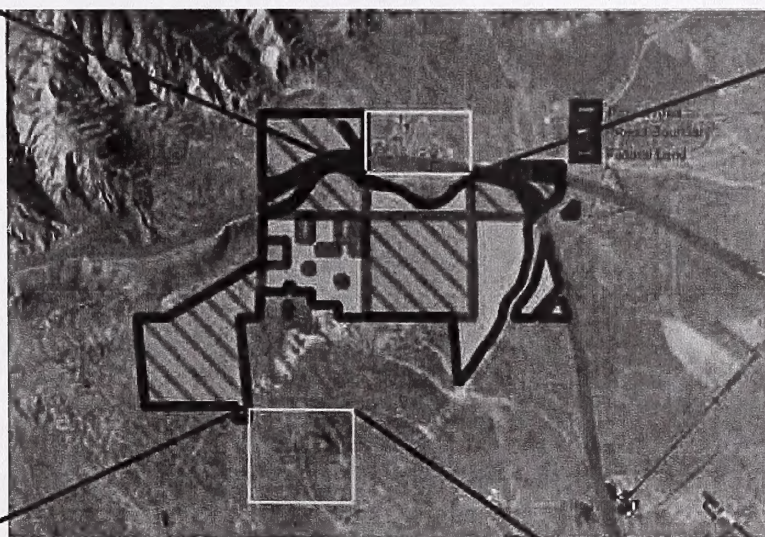
Kern County, CA



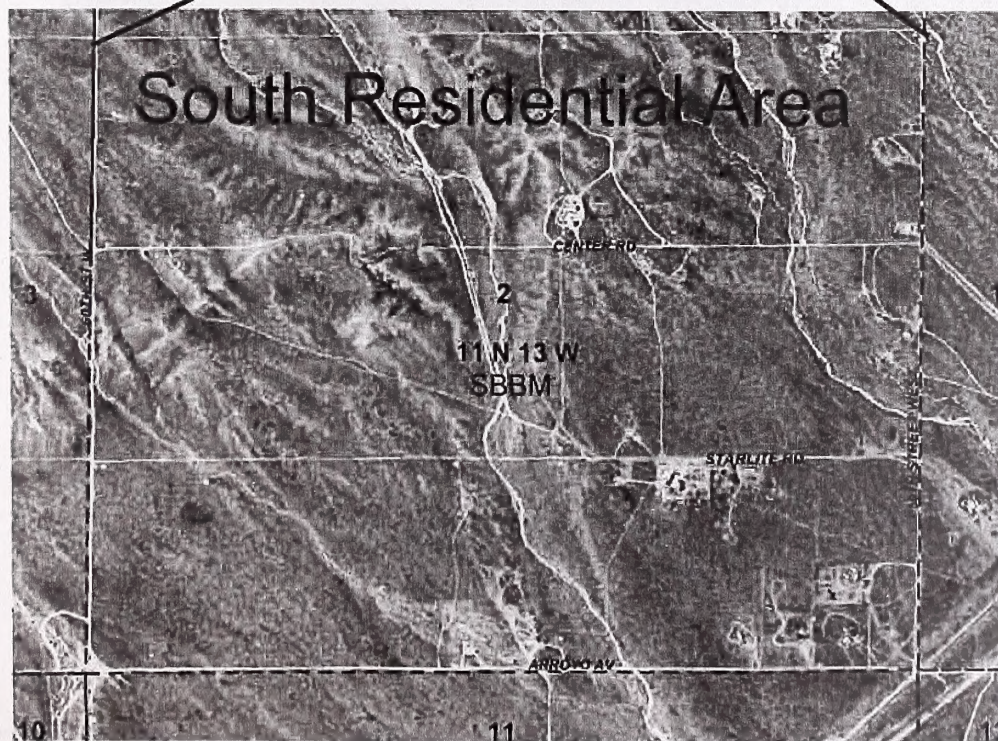
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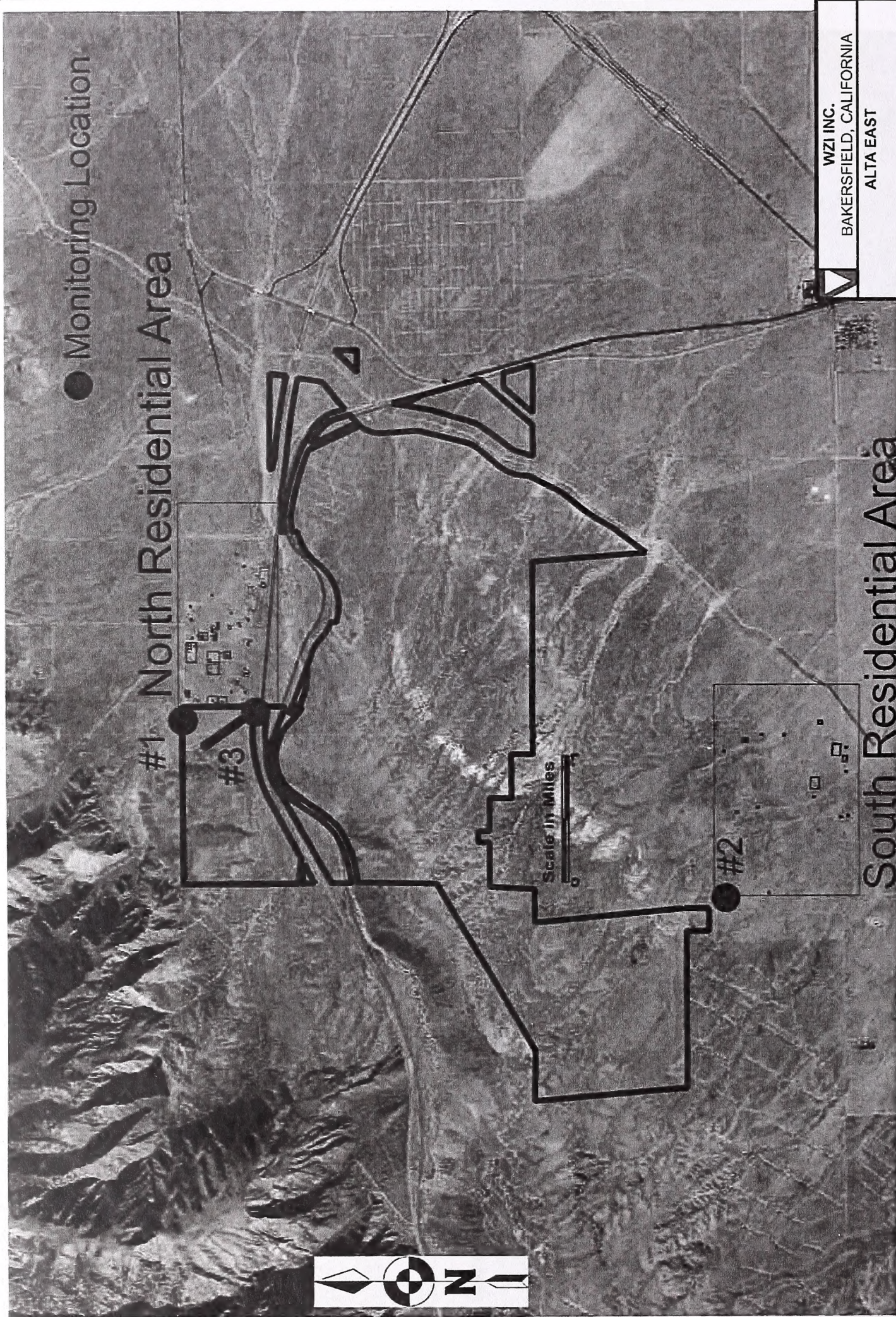
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	ALTA EAST	
	Location Map	
DATE 04/11	TerraGen	FIGURE 1



No Scale



	WZI INC.
	BAKERSFIELD, CALIFORNIA
	ALTA EAST
	Base Map Showing Nearby Sensitive Receptors
DATE	04/11
	TerraGen
	FIGURE 2



● Monitoring Location

#1 North Residential Area

#3

#2

South Residential Area

Scale in Miles

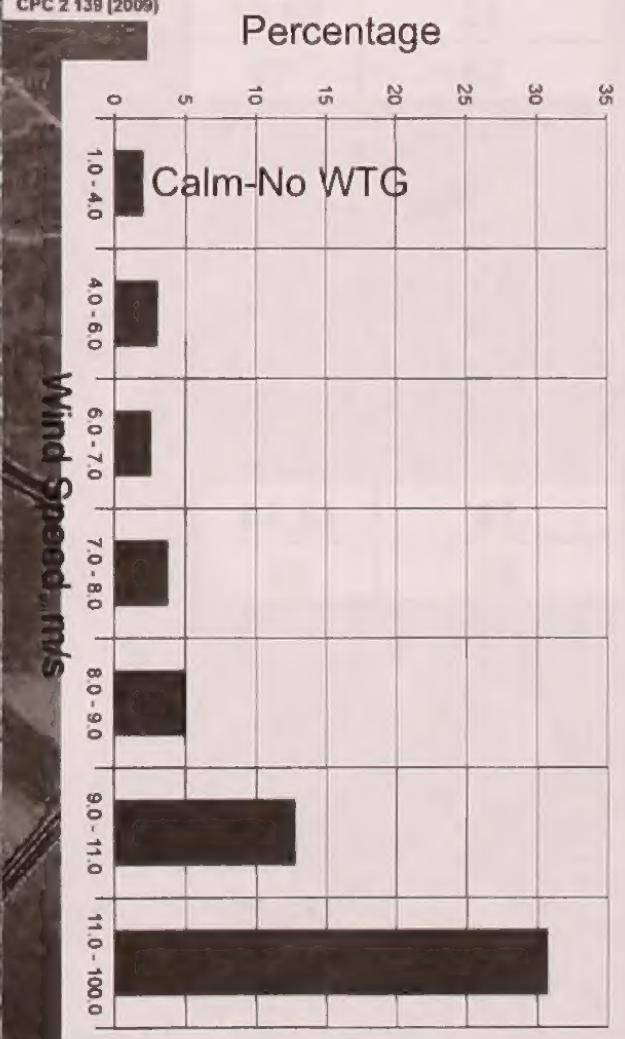
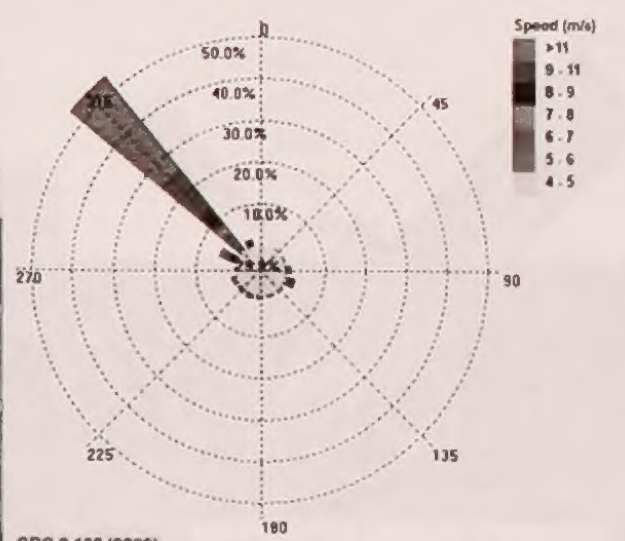
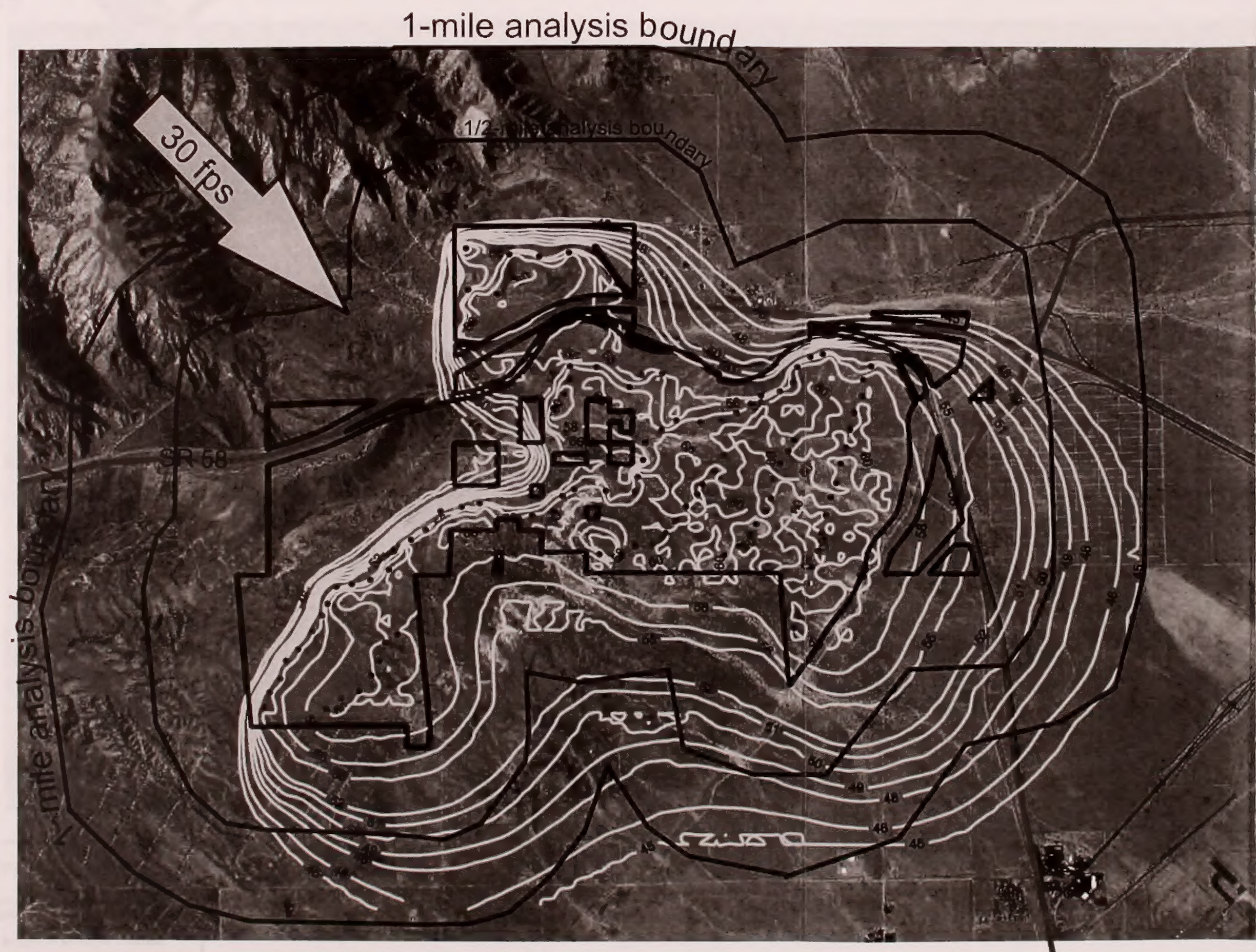
WZI INC.
BAKERSFIELD, CALIFORNIA
ALTA EAST

Base Map Showing Monitoring
Locations and Sensitive
Receptors

DATE
04/11

TerraGen

FIGURE 3



315

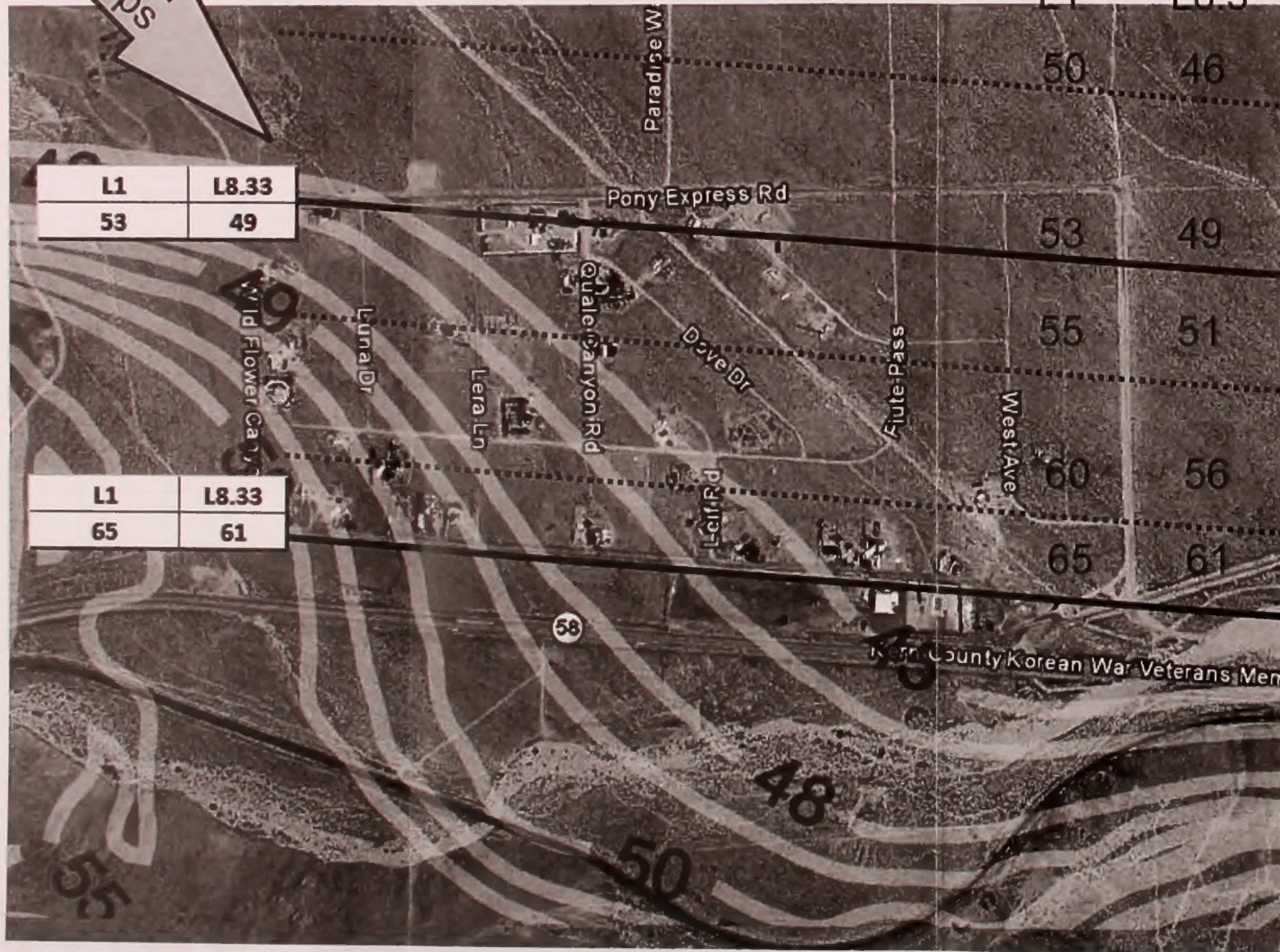
WZI INC.
BAKERSFIELD, CALIFORNIA

ALTA EAST
Impact Analysis ENM-Model
Predicted Noise Levels for
Winds from 315 degrees,
30 feet per second

DATE
04/11

TerraGen

FIGURE 4



L1	L8.33
53	49

L1	L8.33
65	61

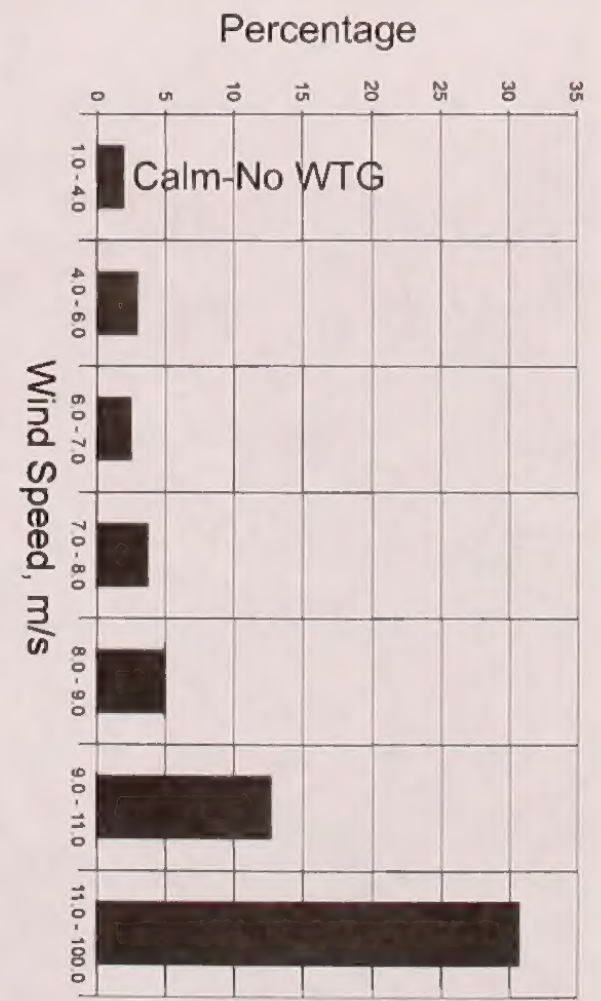
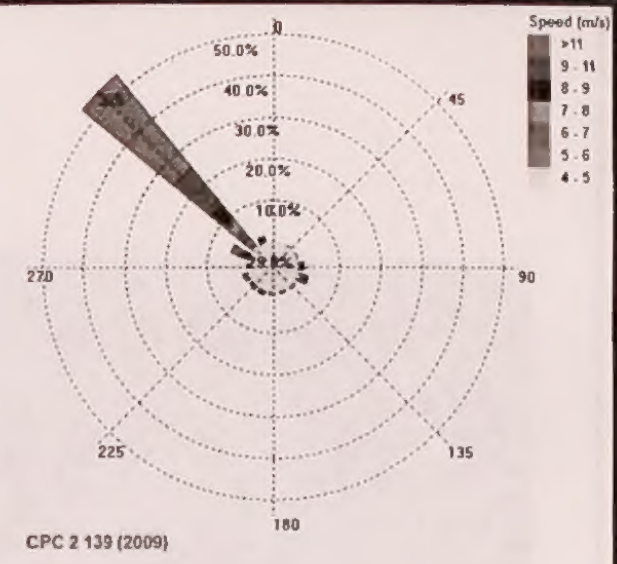
2800 feet

1800 feet

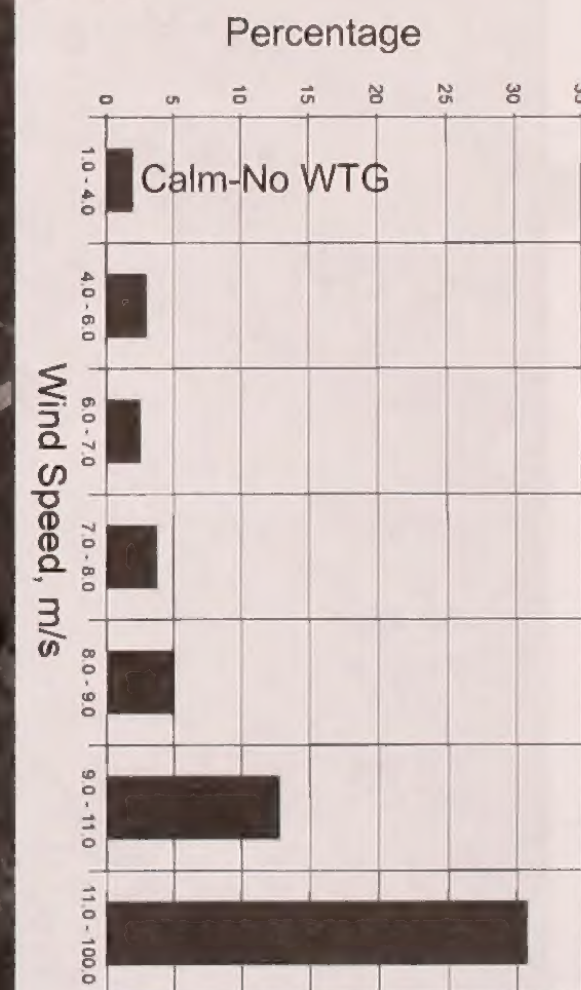
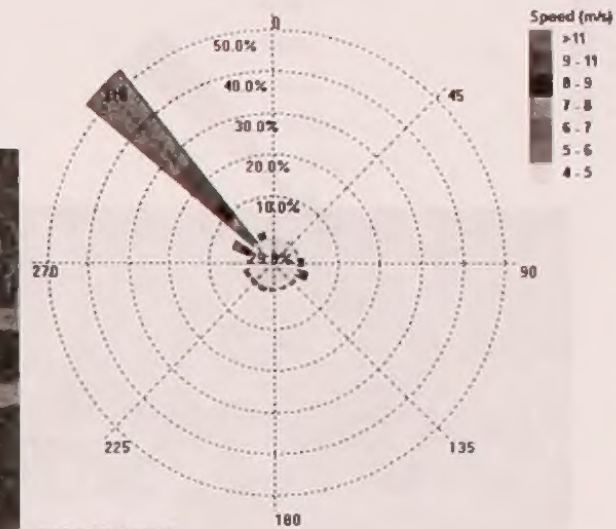
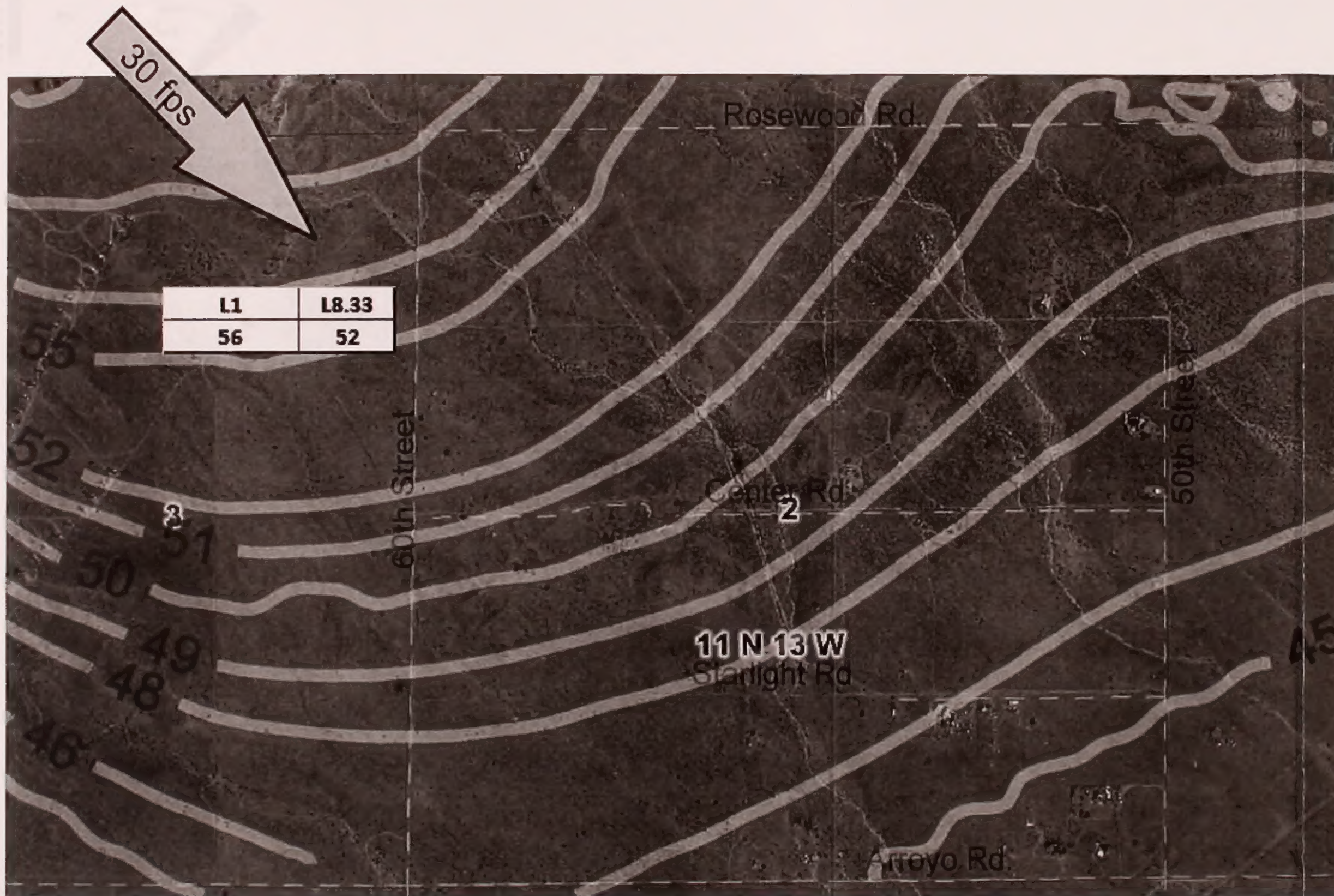
1400 feet

700 feet

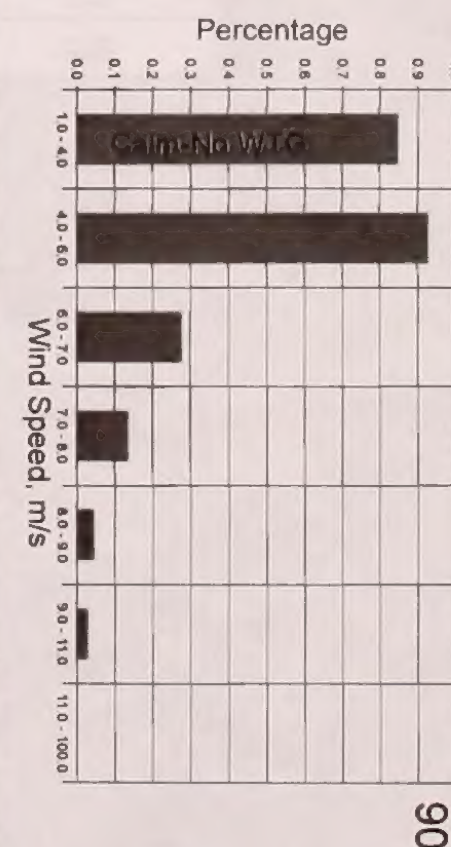
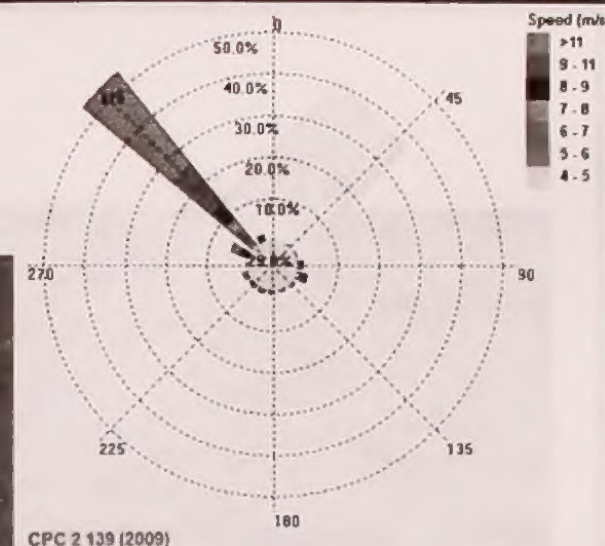
350 feet

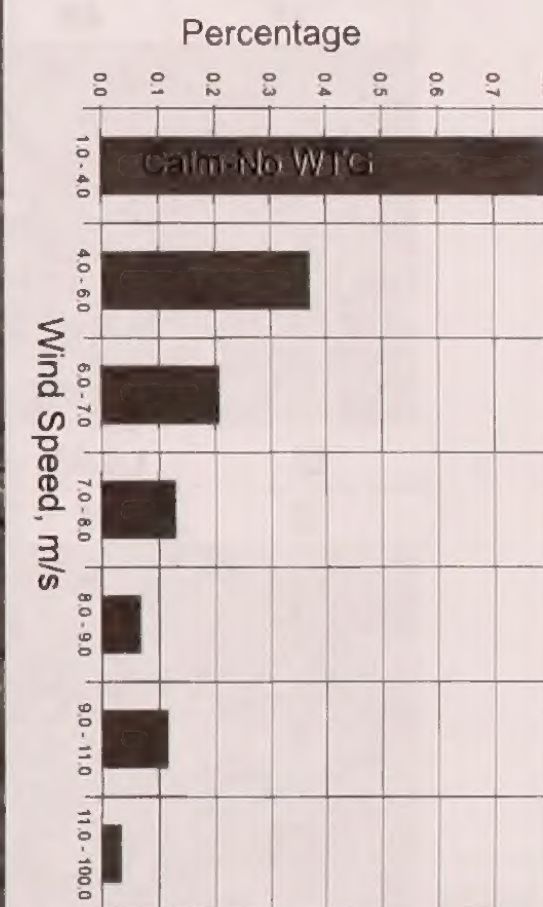
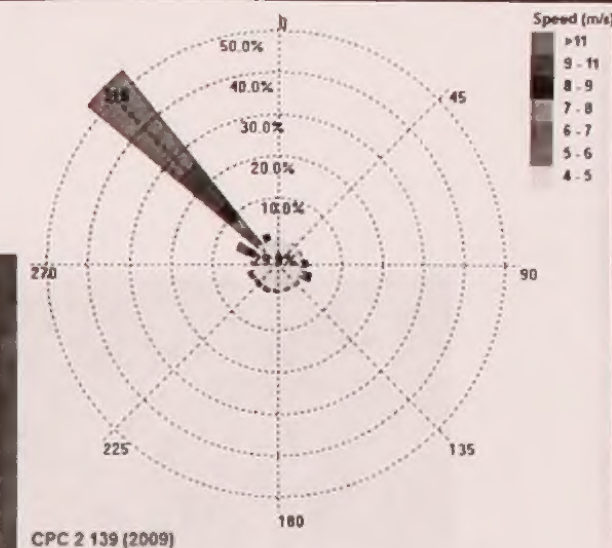


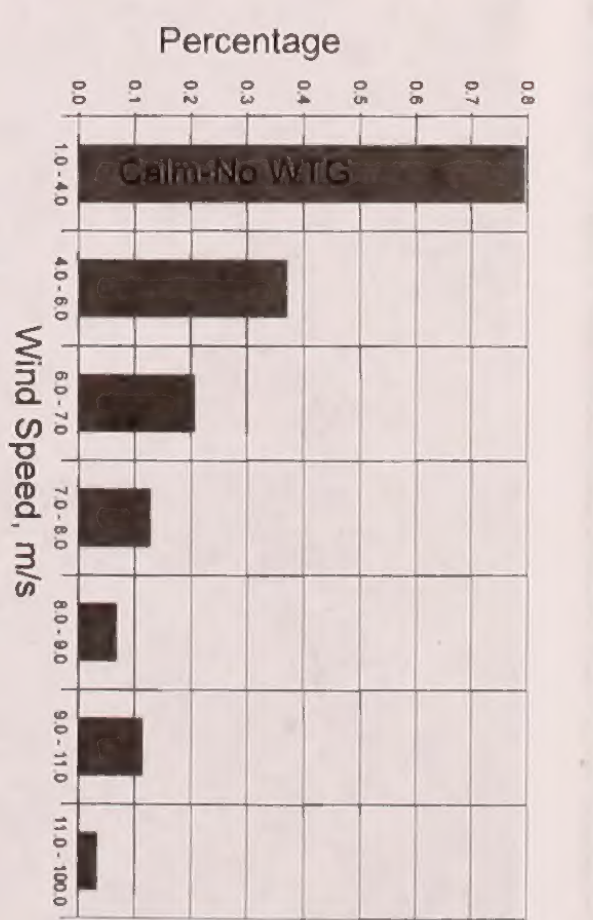
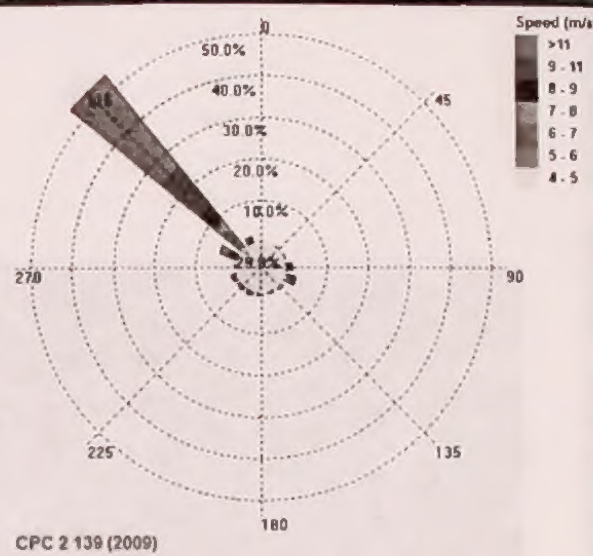
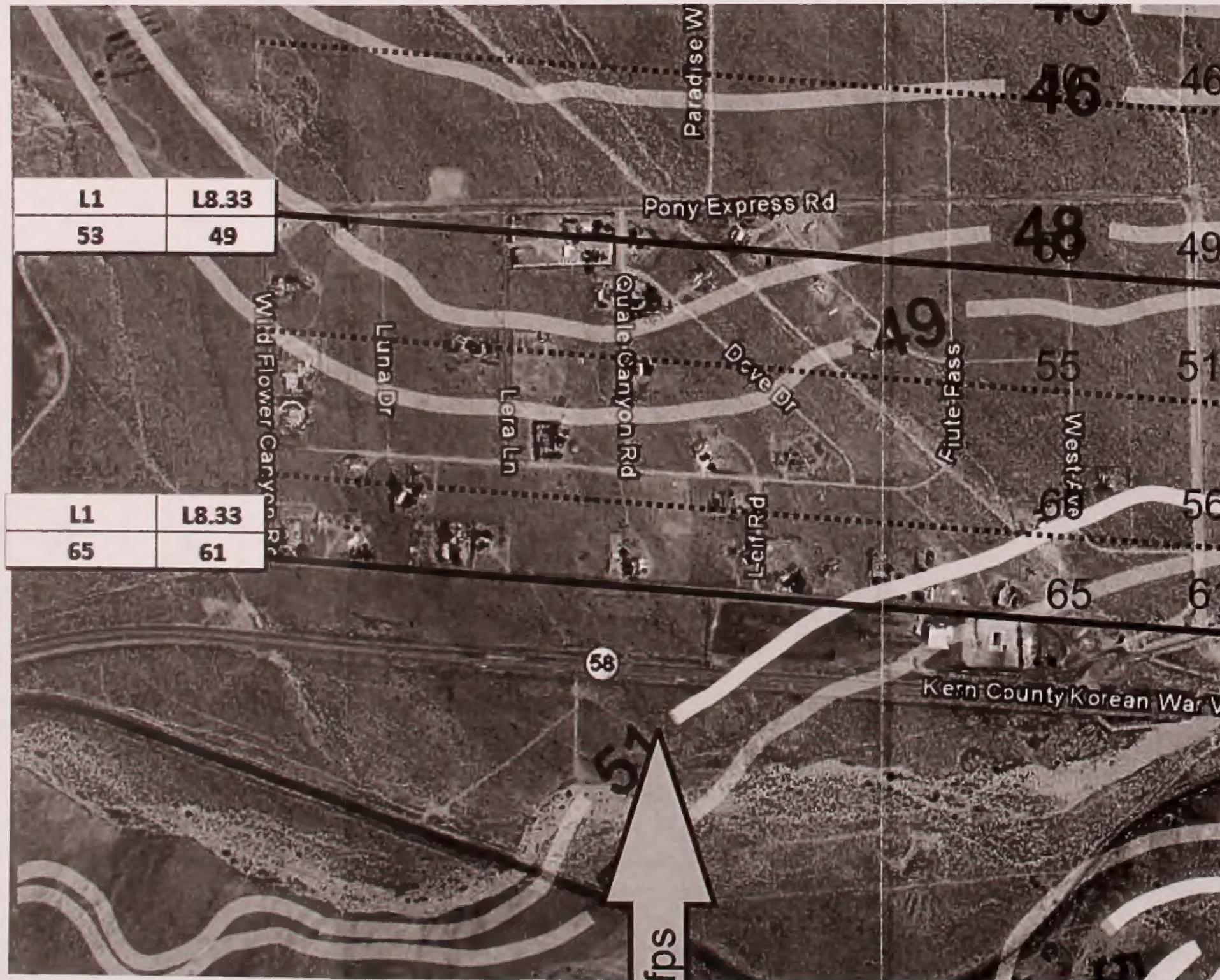
315



315

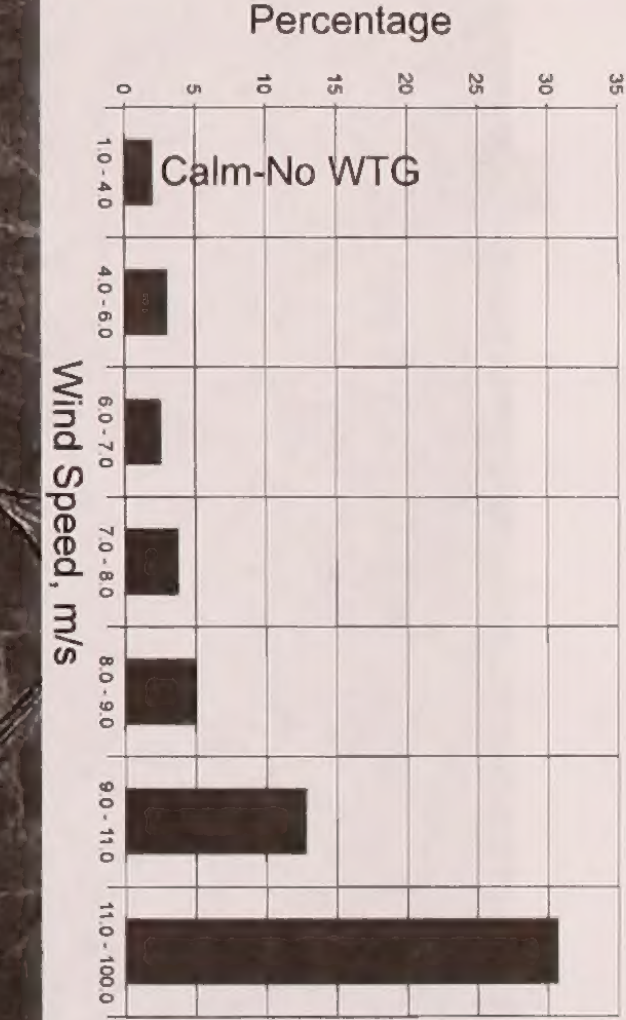
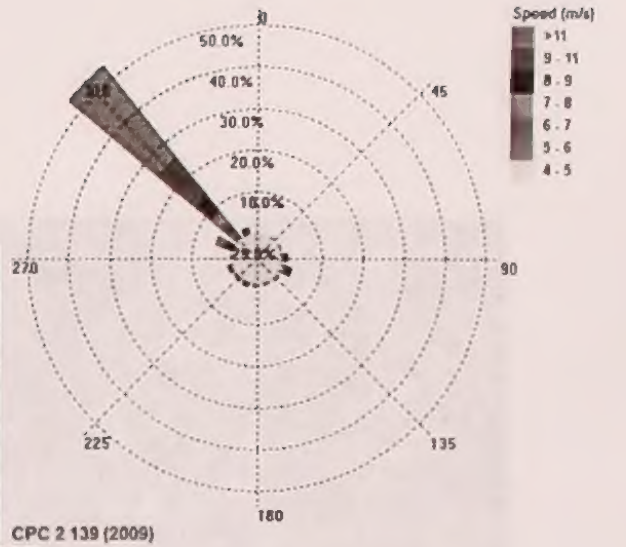


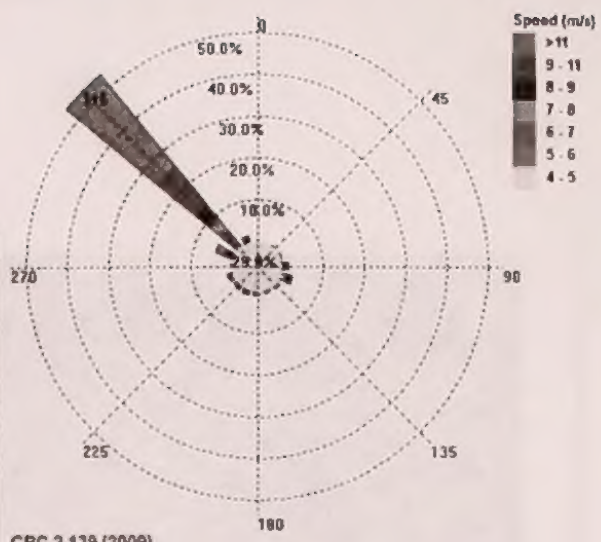




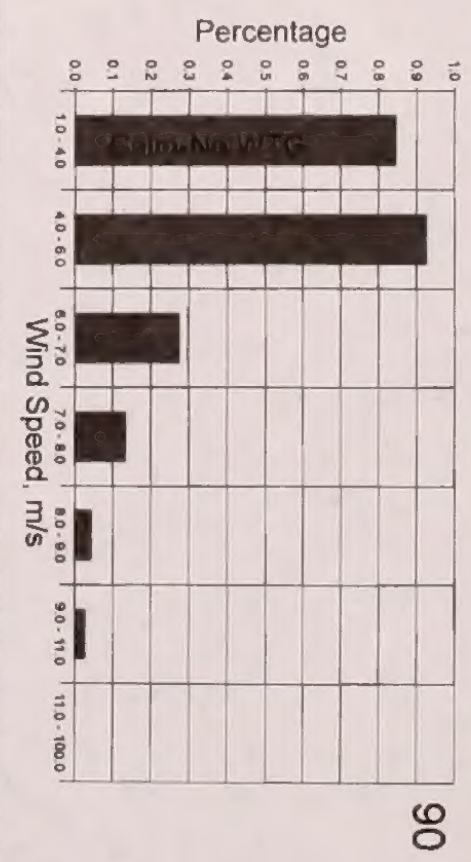
L1	L8.33
53	49

L1	L8.33
65	61





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WZI INC.
BAKERSFIELD, CALIFORNIA

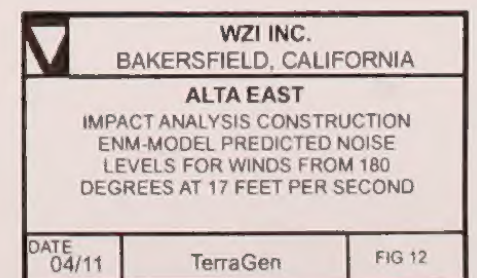
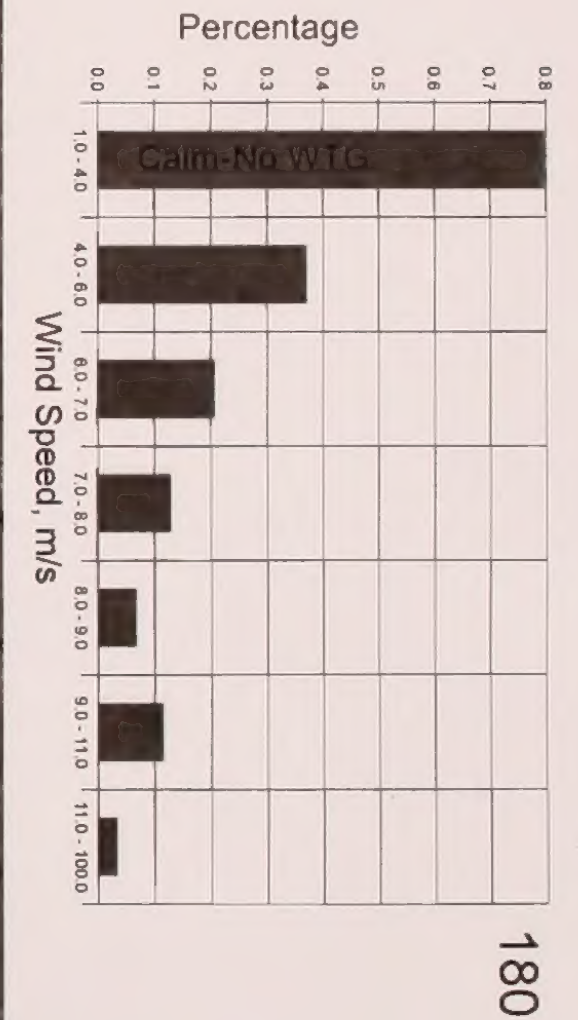
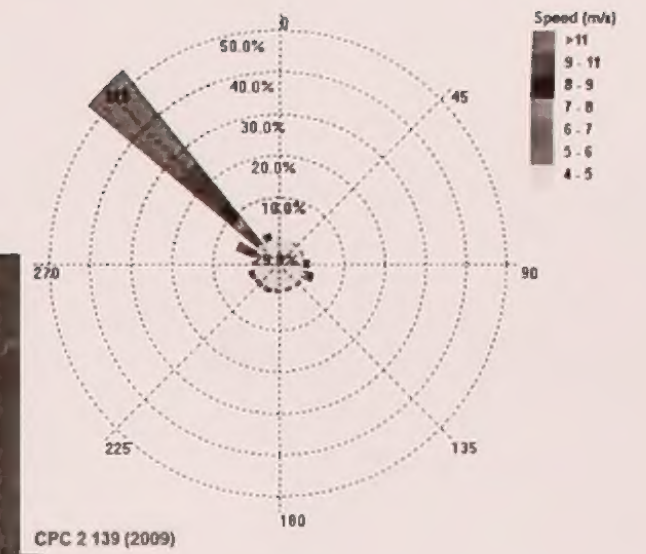
ALTA EAST

IMPACT ANALYSIS CONSTRUCTION ENM-
MODEL PREDICTED NOISE LEVELS FOR
WINDS FROM 90 DEGREES AT 30 FEET
PER SECOND

DATE
04/11

TerraGen

FIG 11



EXHIBITS

Exhibit 1

Noise Data, Vestas 3.0 Wind Turbines

Source Data

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011A #1 v90 3.0 hh260ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

1 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

1764.48722180724 1828.49522259831 1267.96801567078 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011A #2 v90 3.0 hh260ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

2 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

1830.62882262468 1977.84722444415 1267.96801567078 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011A #3 v90 3.0 hh260ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

3 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

1920.84962373972 2100.07202595472 1267.96801567078 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011A #4 v90 3.0 hh260ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

4 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

1987.29602456093 2261.61602795124 1267.96801567078 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1
5,1
6,1
7,1
*Title
2011A #5 v90 3.0 hh260ft 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
5 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
2091.53762584925 2387.80322951078 1267.96801567078 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title
2011A #6 v90 3.0 hh260ft 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source

6 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2224.43042749167 2549.3472315073 1267.96801567078 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011A #7 v90 3.0 hh260ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

7 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2295.44882836938 2675.53443306685 1267.96801567078 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011A #8 v90 3.0 hh260ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

8 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2361.89522919059 2813.30403476954 1267.96801567078 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1
 5,1
 6,1
 7,1
 *Title
 2011b #1 v90 3.0 hh360ft 30fps
 *Page
 1 , 0 , 0 , 0, 0

*= Formula

*Source
 9 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates
 2338.12082889676 1836.11522269249 1222.24801510572 0 0
 0

*Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
 *Directivity-V3.05
 0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011b #2 v90 3.0 hh360ft 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source
 10 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates

2466.13683047891 1919.02082371712 1222.24801510572 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011b #3 v90 3.0 hh360ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

11 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2632.25283253193 2001.62162473798 1222.24801510572 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011b #4 v90 3.0 hh360ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

12 , 'POINT' , 0 , , , , 3.3E+6, 0.01, 0.01, 0.01, 0.01, 0.01

*Title

*I

*X, Y, Z: Source Coordinates

2774.59443429112 2131.77122634649 1222.24801510572 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011b #5 v90 3.0 hh360ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

13 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2821.83843487501 2277.46562814713 1222.24801510572 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011b #6 v90 3.0 hh360ft 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

14 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2864.51043540239 2435.04723009467 1222.24801510572 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	81	,90	,101	,103	,105	,103	,105	,95	,86	,78

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2011b #7 v90 3.0 hh360ft 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

15 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2983.07763686776 2521.91523116827 1222.24801510572 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012A #1v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

16 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3574.38964417577 6160.31287613511 1237.48801529408 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012A #2 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

17 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3591.15364438295 5700.36967045069 1207.00801491737 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012A #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

18 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3582.61924427748 5390.6928666234 1176.52801454067 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1
6,1
7,1
*Title
2012A #4 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
19 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
3964.22884899378 6051.19447478652 1237.48801529408 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1

*Title
2012A #5 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
20 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates

3972.45844909549 5844.84487223625 1207.00801491737 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012A #6 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

21 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3856.32964766026 5665.92727002502 1176.52801454067 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1
 3,1
 4,1
 5,1
 6,1
 7,1
 *Title
 2012A #8 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0, 0

*= Formula

*Source
 23 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates
 4478.42645534873 6051.19447478652 1176.52801454067 0 0
 0
 *Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
 *Directivity-V3.05
 0,0,0,0,0,1,0
 *Octave
 *Y

1,1
 2,1
 3,1
 4,1
 5,1
 6,1
 7,1
 *Title
 2012A #9 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0, 0

*= Formula

*Source
 24 , 'POINT' , 0 , , ,
 *Title


```

*I

*X, Y, Z: Source Coordinates
4835.04245975614      6113.06887555122      1161.28801435232      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5   63   125   250   500   1k   2k   4k   8k   16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2012A #6 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
22 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
4204.71605196595      6003.03607419133      1207.00801491737      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5   63   125   250   500   1k   2k   4k   8k   16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0

```


*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012B #1 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

25 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

4329.07445350289 4605.83285692334 1283.20801585913 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012B #2 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source
 26 , 'POINT' , 0 , , ,
 *Title

 *I

 *X, Y, Z: Source Coordinates
 4395.5208543241 4736.59205853939 1283.20801585913 0 0 0
 *Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
 *Directivity-V3.05
 0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012B #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source
 27 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates
 4445.20325493813 4860.64566007257 1283.20801585913 0 0
 0

*Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
 *Directivity-V3.05
 0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012B #4 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

28 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

4503.42005565763 4998.41526177526 1283.20801585913 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012B #5 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source
29 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
4727.14325842261 4963.97286134958 1283.20801585913 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #1 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source
30 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates
4146.80405125022 3614.92804467678 1207.00801491737 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #2 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

31 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

4329.07445350289 3628.6440448463 1207.00801491737 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source
32 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
4395.5208543241 3759.40324646235 1207.00801491737 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #4 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source
33 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
4528.10885596275 3821.27764722705 1207.00801491737 0 0
0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #5 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

34 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

4801.81925934553 3828.28804731369 1176.52801454067 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #6 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

35 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

4727.14325842261 3243.37684008479 1161.28801435232 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012C #7 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

101 , 'POINT' , 0 , , ,

*Title

*I

SE corner 2012 added after check jdf

*X, Y, Z: Source Coordinates

4901.48886057735 3291.53524067998 1146.04801416397 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012D #1 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

36 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2380.18322941661 2940.40563634038 1261.87201559544 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012D #2 v90 3.0 hh80m 30fps

*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
37 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates
2537.76483136416 2988.56403693557 1261.87201559544 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,

*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1

*Title
2012D #3 v90 3.0 hh80m 30fps

*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
38 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates
2720.03523361683 2988.56403693557 1261.87201559544 0 0
0

*Frequency Range
2 , 29 , 'SPECT'


```

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2012D #4 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

```

*= Formula

```

*Source
39 , 'POINT' , 0 , , ,
*Title

```

*I

```

*X, Y, Z: Source Coordinates
2861.15763536096 3112.61763846874 1261.87201559544 0 0
0
*Frequency Range
2 , 29 , 'SPECT'

```

```

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title

```


2012D #5 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

40 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

2902.61043587327 3263.79844033718 1261.87201559544 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012D #6 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

41 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3043.7328376174 3380.84164178371 1261.87201559544 0 0 0

*Frequency Range

2 , 29 , 'SPECT'


```

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2012D #7 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

```

*= Formula

*Source

42 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3176.32083925605 3484.16884306073 1261.87201559544 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

```

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title

```


2012D #8 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

43 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3350.36164140701 3614.92804467678 1261.87201559544 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2012D #9 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

44 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

3516.47764346004 3676.80244544148 1261.87201559544 0 0

0

*Frequency Range


```

2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2012D #10 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

```

*= Formula

```

*Source
45 , 'POINT' , 0 , , ,
*Title

```

*I

```

*X, Y, Z: Source Coordinates
3707.28244581819 3711.24484586716 1261.87201559544 0 0
0

```

```

*Frequency Range
2 , 29 , 'SPECT'

```

```

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1

```



```

7,1
*Title
2021A #1 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
46 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6511.74728047848      2554.83363157511      1069.84801322222      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2021A #2 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
47 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates

```


6554.41928100586 2703.88083341718 1069.84801322222 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2021A #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

48 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6592.21448147297 2853.23283526301 1069.84801322222 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1
 5,1
 6,1
 7,1
 *Title
 2022A #1 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0 , 0

*= Formula

*Source
 49 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates
 5062.42326256633 4807.91525942087 1237.48801529408 0 0
 0

*Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
 *Directivity-V3.05
 0,0,0,0,0,1,0

*Octave

*Y

1,1
 2,1
 3,1
 4,1
 5,1
 6,1
 7,1

*Title
 2022A #2 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0 , 0

*= Formula

*Source
 50 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates

5153.86326369643 4913.98566073179 1222.24801510572 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022A #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

51 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5336.74326595664 4958.48646128178 1191.76801472902 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1
 3,1
 4,1
 5,1
 6,1
 7,1
 *Title
 2022B #1 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0, 0

 *= Formula

 *Source
 52 , 'POINT' , 0 , , ,
 *Title

 *I

 *X, Y, Z: Source Coordinates
 5062.42326256633 3842.61364749074 1176.52801454067 0 0
 0
 *Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

 ,
 *Directivity-V3.05
 0,0,0,0,0,1,0
 *Octave
 *Y
 1,1
 2,1
 3,1
 4,1
 5,1
 6,1
 7,1
 *Title
 2022B #2 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0, 0

 *= Formula

 *Source
 53 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5112.10566318035 4085.23445048928 1176.52801454067 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022B #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

54 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5162.09286379814 4134.91685110331 1176.52801454067 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave


```

*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #4 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
55 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5187.08646410704 4303.1664531827 1176.52801454067 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #5 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
56 , 'POINT' , 0 , , ,

```


*Title

*I

*X, Y, Z: Source Coordinates

5319.97926574945 4444.89845493436 1176.52801454067 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022B #6 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

57 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5452.87206739187 4542.12965613604 1176.52801454067 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave


```

*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #7 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
58 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5660.74566996098      4524.45125591755      1161.28801435232      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5    63    125    250    500    1k    2k    4k    8k    16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #8 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source

```


59 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5868.61927253008 4506.77285569906 1130.80801397562 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0, 0, 0, 0, 0, 1, 0

*Octave

*Y

1, 1

2, 1

3, 1

4, 1

5, 1

6, 1

7, 1

*Title

2022B #9 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

60 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6001.5120741725 4559.80805635452 1130.80801397562 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0, 0, 0, 0, 0, 1, 0

*Octave


```

*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #10 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
61 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6142.93927592039 4630.82645723224 1115.56801378727 0 0
0
*Frequency Range
2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #11 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source

```


62 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6217.92007684708 4683.8616578877 1115.56801378727 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----

31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022B #12 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

63 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6384.0360789001 4736.89685854316 1100.32801359892 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----

31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y
 1,1
 2,1
 3,1
 4,1
 5,1
 6,1
 7,1
 *Title
 2022B #13 v90 3.0 hh80m 30fps
 *Page
 1 , 0 , 0 , 0, 0

*= Formula

*Source
 64 , 'POINT' , 0 , , ,
 *Title

*I

*X, Y, Z: Source Coordinates
 6467.24647992849 4843.27205985785 1100.32801359892 0 0
 0

*Frequency Range
 2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level									
114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
 *Directivity-V3.05
 0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title
 2022B #14 v90 3.0 hh80m 30fps

*Page
 1 , 0 , 0 , 0, 0

*= Formula

*Source

65 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6533.6928807497 4993.84326171875 1085.08801341057 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022B #15 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0, 0

*= Formula

*Source

66 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6633.36248198152 5064.5568625927 1085.08801341057 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y


```

1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022B #16 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
67 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6799.78328403831      5126.73606336117      1085.08801341057      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022C #1 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source

```


68 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5070.65286266804 3337.86484125257 1130.80801397562 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022C #2 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

69 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5228.53926461935 3373.52644169331 1130.80801397562 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022C #3 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

70 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5353.20246616006 3453.0792426765 1130.80801397562 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022C #4 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula


```

*Source
71 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5436.41286718845      3559.45444399118      1130.80801397562      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022C #5 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
72 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5511.08886811137      3701.18644574285      1130.80801397562      0      0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5  63  125  250  500  1k  2k  4k  8k  16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05

```


0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022C #6 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

73 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5627.52246955037 3798.41764694452 1130.80801397562 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022C #7 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source
74 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5693.96887037158 3930.09124857187 1130.80801397562 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1

*Title
2022C #8 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
75 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5785.40887150168 4046.22005000711 1130.80801397562 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,


```

*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022C #9 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
76 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
5885.38327273727 4179.11285164952 1130.80801397562 0 0
0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022D #1 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

```


*= Formula

*Source

77 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5835.39607211947 3258.31204026938 1100.32801359892 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022D #2 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

78 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

5985.05287396908 3320.18644103408 1100.32801359892 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level


```

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022D #3 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
79 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6092.9520753026 3417.72244223952 1100.32801359892 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022D #4 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

```


*= Formula

*Source

80 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6176.162476331 3532.93684366345 1100.32801359892 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022D #5 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

81 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6251.14327725768 3665.52484530211 1100.32801359892 0 0

0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level


```

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022D #6 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
82 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6309.36007797718 3771.90004661679 1100.32801359892 0 0
0
*Frequency Range
2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022D #7 v90 3.0 hh80m 30fps
*Page

```


1 , 0 , 0 , 0 , 0

*= Formula

*Source

83 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6342.58327838779 3940.14964869618 1100.32801359892 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----

31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5, 100.9, 100.8, 96.6 , 93.6 , 87.4 , 83.8 , 80.2

,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022D #8 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

84 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6392.26567900181 4073.0424503386 1100.32801359892 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022D #9 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

85 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6450.48247972131 4214.4696520865 1100.32801359892 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022D #10 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

86 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6533.6928807497 4347.36245372891 1100.32801359892 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 , 110 , 104.5 , 100.9 , 100.8 , 96.6 , 93.6 , 87.4 , 83.8 , 80.2

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022E #1 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

87 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6616.9032817781 2992.52643698454 1069.84801322222 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022E #2 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

88 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6658.35608229041 3143.09763884544 1069.84801322222 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1


```

*Title
2022E #3 v90 3.0 hh80m 30fps
*Page
  1 , 0 , 0 , 0 , 0

*= Formula

*Source
89 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6708.3432829082      3302.50804081559      1069.84801322222      0      0      0
*Frequency Range
  2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
      31.5      63      125      250      500      1k      2k      4k      8k      16k
*Level
      114      ,110      ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2
,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022E #4 v90 3.0 hh80m 30fps
*Page
  1 , 0 , 0 , 0 , 0

*= Formula

*Source
90 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6774.78968372941      3435.40084245801      1069.84801322222      0      0
0
*Frequency Range

```


2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022E #5 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
91 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6799.78328403831 3612.48964464665 1069.84801322222 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1

*Title
2022E #6 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
92 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6841.23608455062 3763.06084650755 1069.84801322222 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1
2,1
3,1
4,1
5,1
6,1
7,1

*Title
2022E #7 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
93 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6891.22328516841 3913.63204836845 1069.84801322222 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022E #8 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

94 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

6932.67608568072 4081.88165044785 1069.84801322222 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1
*Title
2022E #9 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
95 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
6982.66328629851 4258.97045263648 1069.84801322222 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title
2022E #10 v90 3.0 hh80m 30fps

*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
96 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates

7032.34568691254 4409.54165449739 1069.84801322222 0 0
0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
2022E #11 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0 , 0

*= Formula

*Source
97 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
7074.10328742862 4559.80805635452 1069.84801322222 0 0
0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2

,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1

5,1
6,1
7,1
*Title
2022E #12 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
98 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates
7115.55608794093 4710.37925821543 1069.84801322222 0 0
0

*Frequency Range
2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level	114	,110	,104.5	,100.9	,100.8	,96.6	,93.6	,87.4	,83.8	,80.2
--------	-----	------	--------	--------	--------	-------	-------	-------	-------	-------

,
*Directivity-V3.05
0,0,0,0,0,1,0

*Octave
*Y

1,1
2,1
3,1
4,1
5,1
6,1
7,1

*Title
2022E #13 v90 3.0 hh80m 30fps
*Page
1 , 0 , 0 , 0, 0

*= Formula

*Source
99 , 'POINT' , 0 , , ,
*Title

*I

*X, Y, Z: Source Coordinates

7165.54328855872 4860.95046007633 1069.84801322222 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

2022E #14 v90 3.0 hh80m 30fps

*Page

1 , 0 , 0 , 0 , 0

*= Formula

*Source

100 , 'POINT' , 0 , , ,

*Title

*I

*X, Y, Z: Source Coordinates

7198.76648896933 5011.52166193724 1069.84801322222 0 0
0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

114 ,110 ,104.5,100.9,100.8,96.6 ,93.6 ,87.4 ,83.8 ,80.2

,
*Directivity-V3.05

0,0,0,0,0,1,0

Exhibit 2

Typical Source Data Construction Noise

CNSA1001

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

DUMP TRUCK.

*Page

1, 0, 0, 0, 0

*= Formula

LOG+

*Source

100, 'POINT', 0, 0, 0,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

1756.25762170553 1830.01922261715 1191.76801472902 0 0 0

*Frequency Range

2, 29, 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0,95.0,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

FRONT END LOADER.

*Page

1, 0, 0, 0, 0

*= Formula

LOG+

CNSA1001

*Source
101 , 'POINT' , 0 , 0 , 0 ,
*Title

*I

*X, Y, Z: Source Coordinates
1753.20962166786 1836.11522269249 1191.76801472902 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	104.0	104.0	109.0	112.0	107.0	105.0	102.0	96.0	90.0	90.0

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

ROAD SCRAPER

*Page

1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source

102 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates
1737.36002147198 1842.21122276783 1191.76801472902 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	107.0	108.0	108.0	114.0	104.0	106.0	105.0	92.0	81.0	69.0

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

CEMENT TRUCK.

*Page

1 , 0 , 0 , 0 , 0

CNSA1001

*= Formula

LOG+

*Source

103 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates

1762.35362178087 1848.30722284317 1191.76801472902 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

CNSA1002

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

DUMP TRUCK.

*Page

1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source

200 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

4486.65605545044 6168.23767623305 1161.28801435232 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-v3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

FRONT END LOADER.

*Page

1 , 0 , 0 , 0 , 0

*= Formula

CNSA1002

```

LOG+
*Source
  201 , 'POINT' , 0 , 0 , 0 ,
*Title

*I

*X, Y, Z: Source Coordinates
4489.70405548811    6171.28567627072    1161.28801435232    0    0    0
*Frequency Range
  2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
    31.5    63    125    250    500    1k    2k    4k    8k    16k
*Level
    104.0,104.0,109.0,112.0,107.0,105.0,102.0,96.0 ,90.0 ,90.0 ,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title
ROAD SCRAPER
*Page
  1 , 0 , 0 , 0 , 0

```

```

*= Formula
LOG+
*Source
  202 , 'POINT' , 0 , 0 , 0 ,
*Title

*I

```

```

*X, Y, Z: Source Coordinates
4492.75205552578    6174.33367630839    1161.28801435232    0    0    0
*Frequency Range
  2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
    31.5    63    125    250    500    1k    2k    4k    8k    16k
*Level
    107.0,108.0,108.0,114.0,104.0,106.0,105.0,92.0 ,81.0 ,69.0 ,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
*Y
1,1
2,1
3,1
4,1
5,1
6,1
7,1
*Title

```


CNSA1002

CEMENT TRUCK.

*Page
1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source
203 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates

4498.84805560112 6165.18967619538 1161.28801435232 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

CNSA1003

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

DUMP TRUCK.

*Page

1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source

300 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

7191.75608888269 5003.90166184306 993.648012280464 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-v3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

FRONT END LOADER.

*Page

1 , 0 , 0 , 0 , 0

*= Formula

LOG+

CNSA1003

*Source
301 , 'POINT' , 0 , 0 , 0 ,
*Title

*I

*X, Y, Z: Source Coordinates
7188.70808884502 5003.90166184306 993.648012280464 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	104.0	104.0	109.0	112.0	107.0	105.0	102.0	96.0	90.0	90.0

*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

ROAD SCRAPER

*Page

1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source

302 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates
7185.66008880734 5003.90166184306 993.648012280464 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	107.0	108.0	108.0	114.0	104.0	106.0	105.0	92.0	81.0	69.0

*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

CEMENT TRUCK.

*Page

1 , 0 , 0 , 0 , 0

CNSA1003

*= Formula

LOG+

*Source

303 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates

7182.61208876967 5004.20646184683 993.648012280464 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

CNSA1004

*Octave

*Y

1,1

2,1

3,1

4,1

5,1

6,1

7,1

*Title

DUMP TRUCK.

*Page

1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source

400 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

6500.77448034287 2551.48083153367 1005.84001243115 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

1,1

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*Title

FRONT END LOADER.

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1 , 0 , 0 , 0 , 0

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CNSA1004

*Source
401 , 'POINT' , 0 , 0 , 0 ,
*Title

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*X, Y, Z: Source Coordinates
6506.87048041821 2552.70003154874 1005.84001243115 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	104.0	104.0	109.0	112.0	107.0	105.0	102.0	96.0	90.0	90.0

*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

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*Title

ROAD SCRAPER

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*Source

402 , 'POINT' , 0 , 0 , 0 ,

*Title

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*X, Y, Z: Source Coordinates
6509.91848045588 2548.73763149977 1005.84001243115 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	107.0	108.0	108.0	114.0	104.0	106.0	105.0	92.0	81.0	69.0

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

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*Title

CEMENT TRUCK.

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CNSA1004

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LOG+

*Source

403 , 'POINT' , 0 , 0 , 0 ,

*Title

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*X, Y, Z: Source Coordinates

6506.56568041444 2548.432831496 1005.84001243115 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

CNSB1001

*Octave

*Y

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*Title

DUMP TRUCK.

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LOG+

*Source

100, 'POINT', 0, 0, 0,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

2993.13603699207 2000.09762471914 1158.24001431465 0 0 0

*Frequency Range

2, 29, 'SPECT'

-----FREQUENCY HZ-----

31.5	63	125	250	500	1k	2k	4k	8k	16k
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*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0,95.0,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

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*Title

FRONT END LOADER.

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1, 0, 0, 0, 0

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LOG+

*Source

101, 'POINT', 0, 0, 0,

CNSB1001

*Title

*I

DESCRIPTION CAT 988 Front End Loader. LOCATION #3

*X, Y, Z: Source Coordinates

2993.13603699207 1950.72002410889 1158.24001431465 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

104.0,104.0,109.0,112.0,107.0,105.0,102.0,96.0 ,90.0 ,90.0 ,

*Directivity-v3.05

0,0,0,0,0,1,0

*Octave

*Y

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ROAD SCRAPER

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LOG+

*Source

102 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION SCRAPER LOCATION #3

CNSB1001

*X, Y, Z: Source Coordinates

2956.56003654003 2000.09762471914 1158.24001431465 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----										
31.5	63	125	250	500	1k	2k	4k	8k	16k	

*Level

107.0,108.0,108.0,114.0,104.0,106.0,105.0,92.0 ,81.0 ,69.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

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CEMENT TRUCK.

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LOG+

*Source

103 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT Truck.

*X, Y, Z: Source Coordinates

2926.08003616333 1920.24002373219 1158.24001431465 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----										
31.5	63	125	250	500	1k	2k	4k	8k	16k	

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

CNSB1002

*Octave

*Y

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*Title

DUMP TRUCK.

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LOG+

*Source

200 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

6371.53927874565 2360.37122917175 1002.79201239348 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----

31.5	63	125	250	500	1k	2k	4k	8k	16k
------	----	-----	-----	-----	----	----	----	----	-----

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

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*Title

FRONT END LOADER.

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CNSB1002

*Source
201 , 'POINT' , 0 , 0 , 0 ,
*Title

*I

*X, Y, Z: Source Coordinates
6379.46407884359 1950.72002410889 1002.79201239348 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	104.0	104.0	109.0	112.0	107.0	105.0	102.0	96.0	90.0	90.0

*Directivity-V3.05
0,0,0,0,0,1,0
0,0,0,0,0,1,0

*Octave

*Y

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ROAD SCRAPER

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*Source

202 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates
6388.6080789566 2362.20002919436 1005.84001243115 0 0 0
*Frequency Range
2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	107.0	108.0	108.0	114.0	104.0	106.0	105.0	92.0	81.0	69.0

*Directivity-V3.05
0,0,0,0,0,1,0

*Octave

*Y

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*Title

CEMENT TRUCK.

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CNSB1002

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LOG+

*Source

203 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates

6388.6080789566 2363.41922920942 1005.84001243115 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----										
31.5	63	125	250	500	1k	2k	4k	8k	16k	

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-v3.05

0,0,0,0,0,1,0

CNSB1003

*Octave

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*Title

DUMP TRUCK.

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LOG+

*Source

300 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

6740.34728330374 5200.80246427655 1021.0800126195 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----

31.5	63	125	250	500	1k	2k	4k	8k	16k
------	----	-----	-----	-----	----	----	----	----	-----

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

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FRONT END LOADER.

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Page 1

CNSB1003

301 , 'POINT' , 0 , 0 , 0 ,
*Title

*I
DESCRIPTION CAT 988 Front End Loader. LOCATION #3

*X, Y, Z: Source Coordinates
6743.39528334141 5201.41206428409 1021.0800126195 0 0 0
*Frequency Range
2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
104.0,104.0,109.0,112.0,107.0,105.0,102.0,96.0 ,90.0 ,90.0 ,
*Directivity-V3.05
0,0,0,0,0,1,0
*Octave
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ROAD SCRAPER
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LOG+
*Source
302 , 'POINT' , 0 , 0 , 0 ,
*Title

*I
*X, Y, Z: Source Coordinates
6749.49128341675 5201.71686428785 1021.0800126195 0 0 0
*Frequency Range
2 , 29 , 'SPECT'
-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k
*Level
107.0,108.0,108.0,114.0,104.0,106.0,105.0,92.0 ,81.0 ,69.0 ,
*Directivity-V3.05
0,0,0,0,0,1,0

CNSB1003

*Octave

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*Title

CEMENT TRUCK.

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LOG+

*Source

303, 'POINT', 0, 0, 0,

*Title

*I

DESCRIPTION CAT Truck.

*X, Y, Z: Source Coordinates

6756.19688349962 5201.41206428409 1021.0800126195 0 0 0

*Frequency Range

2, 29, 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0,95.0,

*Directivity-v3.05

0,0,0,0,0,1,0

CNSB1004

*Octave

*Y

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*Title

DUMP TRUCK.

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LOG+

*Source

400 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION CAT 769 Rear Dump Truck.

*X, Y, Z: Source Coordinates

4269.33365276456 6255.41047731042 1158.24001431465 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----									
31.5	63	125	250	500	1k	2k	4k	8k	16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

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*Title

FRONT END LOADER.

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1 , 0 , 0 , 0 , 0

*= Formula

LOG+

*Source

CNSB1004

401 , 'POINT' , 0 , 0 , 0 ,
 *Title

*I
 DESCRIPTION CAT 988 Front End Loader. LOCATION #3

*X, Y, Z: Source Coordinates
 4272.38165280223 6256.02007731795 1158.24001431465 0 0 0
 *Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	104.0	104.0	109.0	112.0	107.0	105.0	102.0	96.0	90.0	90.0

*Directivity-V3.05

0,0,0,0,0,1,0

*Octave

*Y

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*Title

ROAD SCRAPER

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1 , 0 , 0 , 0 , 0

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LOG+

*Source

402 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

*X, Y, Z: Source Coordinates
 4278.47765287757 2001.31682473421 1158.24001431465 0 0 0
 *Frequency Range
 2 , 29 , 'SPECT'

	-----FREQUENCY HZ-----									
	31.5	63	125	250	500	1k	2k	4k	8k	16k
*Level	107.0	108.0	108.0	114.0	104.0	106.0	105.0	92.0	81.0	69.0

*Directivity-V3.05

0,0,0,0,0,1,0

CNSB1004

*Octave

*Y

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*Title

CEMENT TRUCK.

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LOG+

*Source

403 , 'POINT' , 0 , 0 , 0 ,

*Title

*I

DESCRIPTION

CAT Truck.

*X, Y, Z: Source Coordinates

4287.01205298305 6262.11607739329 1158.24001431465 0 0 0

*Frequency Range

2 , 29 , 'SPECT'

-----FREQUENCY HZ-----
31.5 63 125 250 500 1k 2k 4k 8k 16k

*Level

109.0,109.0,114.0,117.0,112.0,110.0,107.0,101.0,95.0 ,95.0 ,

*Directivity-v3.05

0,0,0,0,0,1,0

ATTACHMENTS

ATTACHMENTS

Attachment 1
Background Noise Investigation

Area-wide Background Noise Analysis

1 Summary

The following discussion addresses the use of empirical L₈ noise levels for establishing background conditions for the analysis of audible noise at residential areas on the north side of the project directly adjacent to SR58 and to the south of the project area.

Several sets of data were gathered in accordance with the Kern County Wind Energy Ordinance, see Attachments 1, 2, 3 and 4. The data were matched to time stamped met data and sorted for operational conditions not to exceed 30 feet per second. The L₁ period of time (36 seconds out of any one-hour period) is used as the expression of reliably measurable instant noise levels. Results were used to establish the results indicated that the thresholds for the north residential area which is adjacent to SR 58 should be revised to:

"Audible noise due to wind turbine operations shall not be created which causes the exterior noise level to exceed fifty-five (55) dBA for more than five (5) minutes out of any one- (1-) hour time period (L_{8.3}) or to exceed sixty (60) dBA for any period of time [L₁] when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library".[ed.]

The threshold for the south residential area, which is situated directly downwind of the current wind park area based on prevailing winds, should be revised to:

"Audible noise due to wind turbine operations shall not be created which causes the exterior noise level to exceed fifty-one (51) dBA for more than five (5) minutes out of any one- (1-) hour time period (L_{8.3}) or to exceed fifty-three (53) dBA for any period of time [L₁] when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library".[ed.]

No school, hospital or church is known to exist within the impact area of the proposed project. Monitoring locations were selected based on proximity of the residential area to the proposed Alta East wind project area and the ability to reliably represent the background noise at or around an undisturbed residential receptor, see figure below.

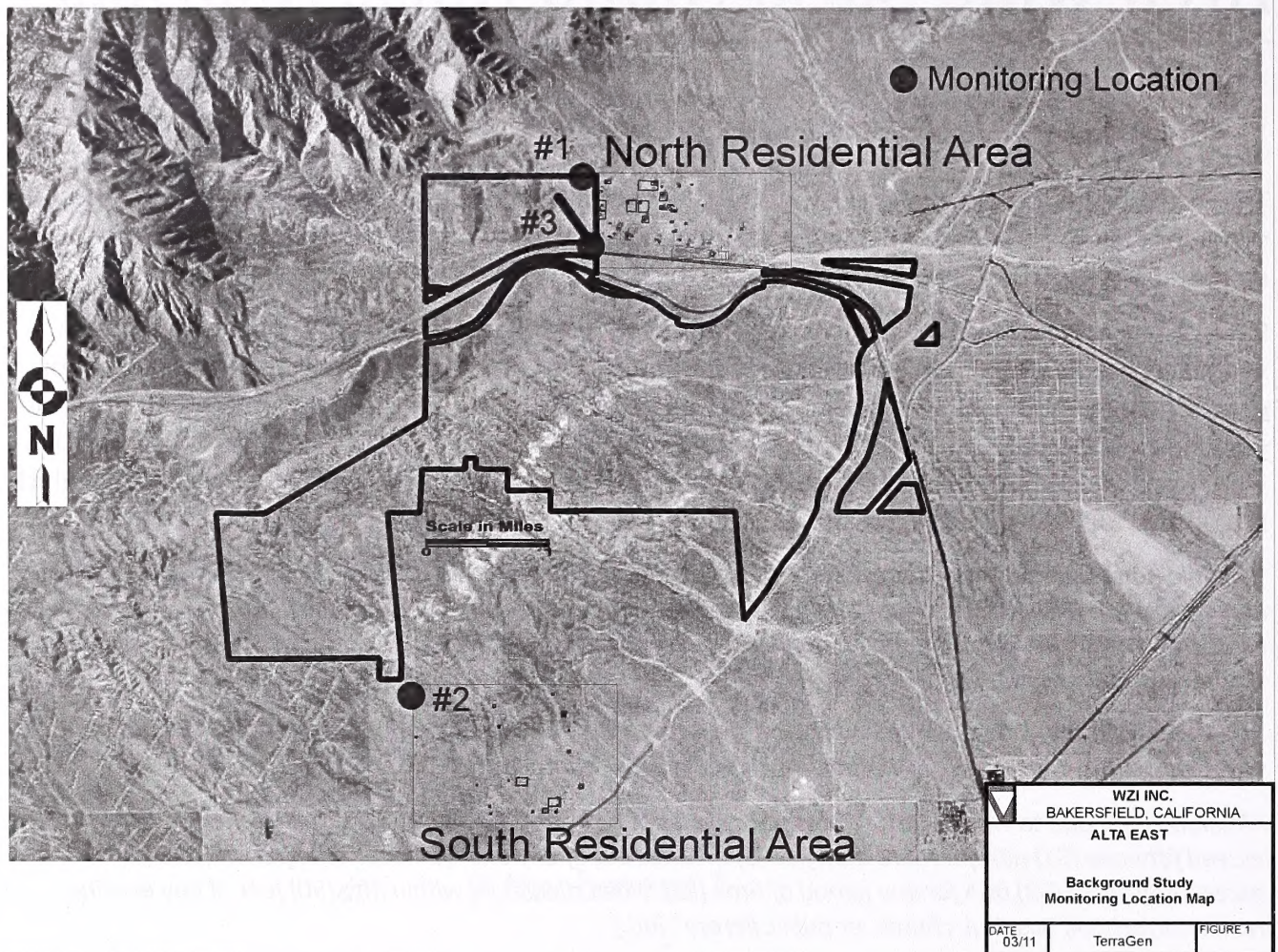


Figure 1

1.1 Monitoring data

Three sets of data were gathered at locations for periods exceeding 24 hours each. These locations and conditions are considered representative of the subject residential areas. The noise sampling locations for the North Residential Area were situated with one location measuring noise levels for near highway receptors (350 feet) and one set back from the highway (2100 feet). The Southern monitoring location was situated directly downwind of the project area between the nearest receptor and the WTGs.

The data were gathered *"when wind velocities at the proposed project site are sufficient to allow wind turbine operation, provided that the wind velocity does not exceed thirty (30) mph at the ambient noise measurement location"*. The resultant L_1 and $L_{8.3}$ value for each monitoring location was truncated to the highest whole number.

1.2 Results of analysis

The resultant data for metering locations 1, 2, and 3 are shown below.

Background Sampling for Threshold Analysis									
Loc.	Monitor Coordinates		Sampling Date		Met data			Background Data, dBA	
					Wind Speed		Dir	L1	L8.33
	Long. W	Lat. N	Start	End	m/s	fps	deg.	dBA	dBA
1	118° 13' 8"	35° 7' 29"	9/7/10 13:10	9/12/1 0 6:20	5.5	17.8	214.0	53.6	49.7
2	118° 14' 18"	35° 4' 51"	9/7/10 11:50	9/9/10 12:50	7.0	22.4	268.1	56.3	52.7
3	118° 13' 9"	35° 7' 9"	3/22/11 8:21	3/23/1 18:51	5.0	16.1	240.5	65.0	61.7

Table 1

The data show that threshold limits for noise should reflect the areal background as shown in the figure below.

The northern area values show the expected trend for receptors in the vicinity of high traffic areas. Monitoring location #4 located nearest SR58 (350 feet from SR58) and the railroad is substantially higher than Monitoring location #1 (2,200 feet from SR58).

The southern area shows the expected trend for wind turbine operations. The higher noise level exists closer to the existing WTG area situated in Section 34.

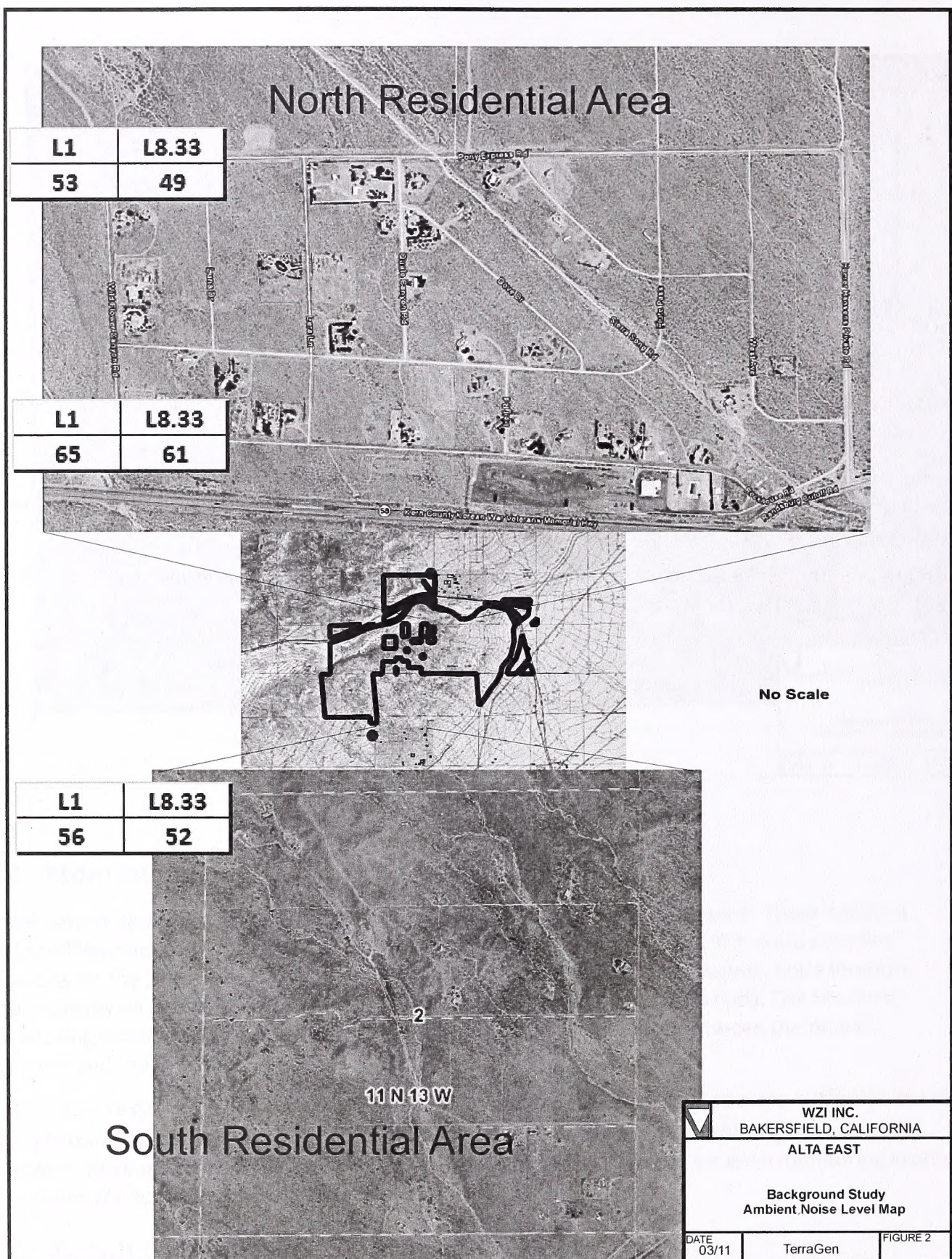


Figure 2



WIND ENERGY (WE) COMBINING DISTRICT

"In the event the ambient noise level (exclusive of the development in question) exceeds one (1) of

measurement techniques shall employ all practical means of reducing the effects of wind-generated noise at the microphone. Ambient noise level measurements may be performed when wind velocities at the proposed project site are sufficient to allow wind turbine operation, **provided that the wind velocity does not exceed thirty (30) mph at the ambient noise measurement location.**"[emph.]

The County default audible thresholds are defined by:

[T]he acoustical report shall demonstrate that the proposed development shall comply with the following criteria:

1. Audible noise due to wind turbine operations shall not be created which causes the exterior noise level to **exceed forty-five (45) dB(A)** for more than five (5) minutes out of any one- (1-) hour time period ($L_{8,3}$) or to exceed fifty (50) dB(A) for any period of time when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library.

3 Origins of Wind Park Noise

3.1 Sources of Noise

In the operating wind turbine areas, ambient noise originates from the surrounding conditions consisting of:

- Alpine Geography and Flora (existing naturally occurring),
- Wind Turbines (both project-related and existing), as well as
- Occasional Vehicular Traffic (primarily project related).

3.2 Ambient Noise as a function of Wind Speed

Historic empirical L_8 values gathered for a two township area range from 49 to 68 dB(A). The levels are defined by the local topography, foliage and proximity to existing wind turbines. The L_1 represents the noise most likely generated during the strongest gusts. The quietest region is the desert floor area to the east during low wind periods. The loudest area is the western region in the canyons where rugged terrain features and alpine foliage create high wind noise.

Wind generated ambient noise increases as a function of wind speed. Area measurements in the alpine regions have established that the L_8 noise level for wind speeds above 5 m/s to 13 m/s generally follows:

$$dBA = 26.253 \times \ln(\text{wind velocity in m/s}) + 2.5117 \quad (\text{eq. 1})$$

Below 4 m/s the background noise is dominated by the normal non-WTG noise generating activities and results are typically around 49 dB(A) L_8 . Above 13 m/s the wind generated ambient noise approaches 70 dB(A) L_8 asymptotically.¹

3.3 Wind Turbine Noise as a function of Wind Speed

Wind turbines begin to dispatch at about 4 meters per second. At these conditions the background noise from wind is low, however the far-field noise impact from the turbines is also low (i.e., the hub noise is below 95 dB(A) and the wind component of the downwind noise propagation is minimal). As the wind

¹ Kern County EIR for PdV Wind Project, Appendix, Noise Study

speed increases the wind turbine noise at the hub increases at a rate that is lower than the increase in background at the ground.

For estimating WTG noise for wind speeds from 3.5 to 7 meters per second:

$$\text{Hub SPL (dB(A)L0)} = 8.061 \times \ln(\text{wind velocity in m/s}) + 96.846 \quad (\text{eq.2})$$

Assuming the winds are sustained for at least 5 continuous minutes, the modeled L8 value is the same as the instantaneous noise i.e., L0. As a practical matter the most reasonable measurable noise level that may be attributed to WTGs is L1 (sustained for any 36 seconds in any given hour period).

3.4 Traffic related noise in the wind park area

Traffic on SR58 will most likely be travelling at speeds in excess of 55 miles per hour. At these speeds the Sound Pressure Level of a passing vehicle is approximately 83 dB(A) at 30 feet from the road side. Allowing for the reduction 6 dB(A) for each distance doubled results in: 77 dB(A) at 60 feet, 71 dB(A) at 120 feet and 65 dB(A) at 240 feet. This result is similar to the results from monitoring Location #3.² Peak noise levels would have to show discrete and consistent episodic values greater than the surrounding wind-related noise to indicate bias in the noise data sets due to traffic passing at highway speeds. This can only occur during times that the wind speeds are low (i.e., during the diurnal lull late at night and during early morning. The table below shows the Kern County General Plan's estimated CNEL traffic contours for the region of SR58 near the northern portion of the proposed project.³

Table 2

		Dist. To 65dBA CNEL	Dist. To 60dBA CNEL	Dist. To 55dBA CNEL		
State Route 14 @ North Junction 158	1/2 mi. either direction	60	125	300	intersection	16.06
State Route 14 @ South Junction State Route 58	1/2 mi. either direction	80	190	400	intersection	(break in route) 16.06
State Route 14 @ Rosamond Blvd.	1 mi. either direction	70	140	350	intersection	3.02
State Route 14 @ County line	1 mi. either direction	80	190	400	intersection	0
State Route 58 @ Summit interchange (Tehachapi)	1 mi. either direction	80	190	400	intersection	94.16
State Route 58 @ Sand Canyon Interchange	1 mi. either direction	80	190	400	intersection	99.25
State Route 58 @ North Junction State Route 14	111.83-112.97	110	250	500	Intersection (North Junction) (South Junction)	111.83 112.97
State Route 58 @ California City Rd.	1 mi. either direction	70	140	350	intersection	127.54
State Route 58 @ Boron Ave.	1 mi. either direction	60	125	300	intersection	142.88

² Line sources will be attenuated by approximately 3 dB until a distance of the length divided by π ($\pi=22/7$) is achieved then the attenuation is approximately 6 dB per distance doubled. Point sources are estimated using a constant attenuation of 6 dB per distance doubled. L_1 (36 seconds) and L_8 (5 minutes) are short duration measurements. Traveling vehicles maintaining a safe distance (at least 300 feet) emit near-field noise in a manner more similar to a point source than a plane or a line.

³ **CNEL** – Community Noise Equivalent Level. The average sound pressure obtained over a 24-hour noise study, with additional factors for time of day. Sound pressures between the hours of 7 P.M. and 10 P.M. are algebraically increased by 5 dB prior to being averaged. Sound pressures between the hours of 10 P.M. and 7 A.M. are algebraically increased by 10 dB prior to being averaged.

Continuous traffic is needed to maintain a steady traffic noise (as one would find on a normally trafficked highway). Commute traffic has a concentration during peak periods. Commute traffic would be found during the normal peak traffic commute hours (6:00 am to 9:00 am as well as 4:00 pm to 7:00pm).

Historic 24-hour data gathered near residential areas show day-time trends that reflect a combination of the diurnal nature of the wind patterns, which may swing from 0 to 45 feet per second between midnight and noon (resulting in approximate wind related noise level swings of 49 to 65 dB(A) respectively) and a background noise associated with SR58 and field roads as well as the rail traffic noise associated with the BNSF rail road. The table below shows the estimated contours from the Kern County General Plan for the rail segments in the vicinity of the proposed project.

Table 3

SEGMENT				DISTANCE IN FEET		
BEGIN	DIRECTION	LENGTH	END	CNEL=60dB	CNEL=65dB	CNEL=55dB
Cable	East	4.2 miles	Tehachapi Station	960	2,160	4,840
Tehachapi Station	East	4.4 miles	Monolith	610	1,190	2,300
Monolith	East	6.8 miles	Cameron Canyon Road	660	1,260	2,400
California Portland Cement (Creal)	East	9.2 miles	Mojave yard	65	150	345
Mojave yard	South	4.1 miles	Fleta (South of Silver Queen Road)	610	1,090	1,970
Ansel (North of Rosamond)	South	7.6 miles	South County Line	720	1,430	2,860
Mojave yard	North	28.4 miles	Saltdale	90	180	390
6 miles south of Inyokern	North	15.3 miles	North County Line	60	150	340

Further, due to the preexistence of SR58, no traffic related noise modeling is considered essential to an adequate analysis of wind turbine related impacts.

3.5 Noise Propagation and Attenuation in Wind Park Areas

Propagation refers to how sound travels. Attenuation refers to how sound is reduced by various factors.

Many factors contribute to how sound propagates and is attenuated, including air temperature, humidity, barriers, reflections, and ground surface materials. Ignoring the impact of terrain, for a reasonably flat terrain, the two most influential factors are distance as well as wind direction and its speed.

3.5.1 Distance

At near-field, i.e., the distance near a source, the geometry of the source does not appear as a single point element. The noise radiates from various surfaces at different angles relative to the shape of the noise source. Some sources are linear and some are planar. For this reason, efforts to model near-field conditions are not considered particularly reliable. Modeling results and noise data gathered at far-field conditions, i.e., locations at least one wavelength (as defined by the equation):

$$\lambda = c/f \text{ eq.3}$$

Where: λ =wavelength in feet

c =speed of sound (1,126 ft/s)

f = frequency (cycles/s)

are considered more reliable. Typically, because the major machine dimension is established by the tower, the far-field distance is driven by the hub height. Far-field measurements are considered to be increasingly reliable at multiples of the Hub Height up to three. Past this point other adjacent WTG sources with equal Sound Power Level (strength) can contribute sufficient energy to mask the effect of the individual unit when combined.

In a free-field environment, noise energy spreads spherically as radiative emissions; as such the noise energy is diminished by ratio of the square of the radii from the point source. Converting this to decibels for radius 2 being twice the distance as radius 1 results in the equation:

$$dB_{x=2y} = dB_y - 20 \log_{10}((2/1)^2) \text{ eq.4}$$

The base 10 log of 2 is 3. In general, for point sources, doubling the distance from a stationary source reduces the sound level by six decibels.

For wind turbines the low frequency components may travel further than the higher frequency components due to higher air attenuation of high frequency noise. It is for this reason that persons hearing operational noise from wind turbines at a distance typically describe the noise as the low frequency blade rotational noise and not the high frequency mechanical gear and generator noise.

3.5.2 Wind Direction and Speed

Wind direction also has an influence on sound propagation. Directly downwind of the wind turbine within several hundred meters, sound volume will increase in the near field as the distance increase to a point (several hundred meters away) where air attenuation and radiative spreading overcomes the ability of the moving air to carry the noise energy the incremental distance. Directly upwind sound volumes decrease very quickly as the moving air is working with air attenuation and the radiative spreading of the energy. In summary, increasing wind speeds allow noise to carry farther downwind as opposed to upwind.

County Noise criteria for the WE Combining District limits use of noise gathered between normal operations (cut-in) to 30 feet per second. Normal cut-out speeds range well above 30 feet per second depending on model and size of WTG.

The wind rose below shows the regional wind patterns in the Tehachapi Wind Park area.

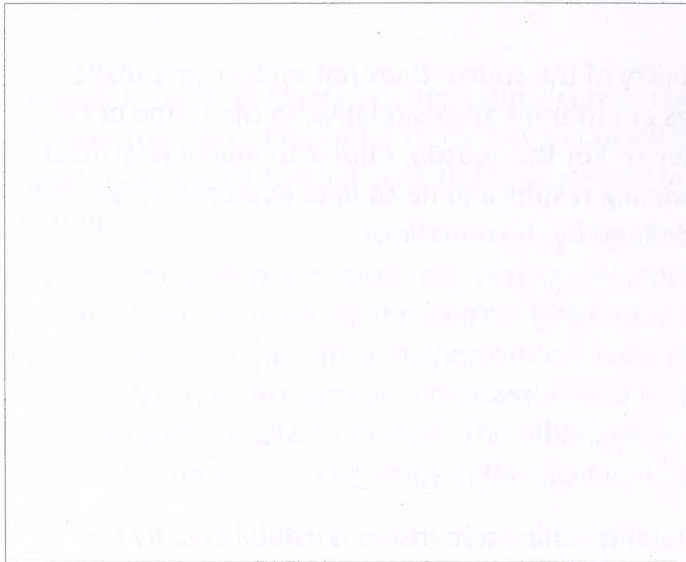


Figure 4

4 Pure Tone Analysis

The Vestas 3.0 MW L_{8.3} based data were plotted and tested against the County's pure tone requirements. Figure 5 below shows the resultant 1/3 frequency bands and the average of the two adjacent bands. The average of the two 1/3 octave bands that are directly adjacent were calculated using the general averaging equation:

$$L_{avg} = 10 \times \log_{10} \left[\sum_{i=1}^n 10^{(dBi/10)} \right] \text{ eq. 5}$$

The not-to-exceed values of 15 dB (125 Hz or less), 8 dB (160 Hz to 400 Hz) and 5 dB (500 Hz or greater) were added. The dotted line represents the limit for defining any pure tones relative to the turbine noise profile.

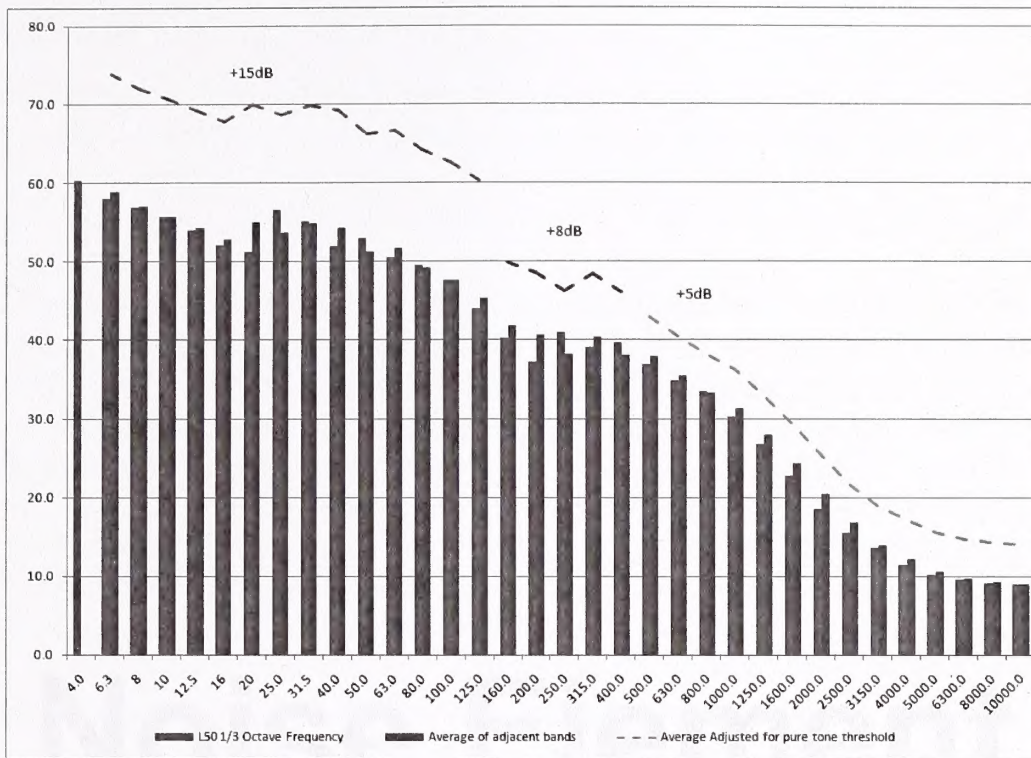


Figure 5 Vestas 3.0 MW Wind Turbine vs Kern County Pure Tone Requirements

As can be seen no specific 1/3 sound power level individually exceeds the arithmetic average of the two adjacent noise levels by the specified range, therefore there are no pure tones for the Vestas 3.0 MW wind turbine.



Attachment 2

Kern County General Plan Noise Element

Noise Element

Chapter 3

3. NOISE ELEMENT

3.1 INTRODUCTION

The Noise Element is a mandatory element of the General Plan (California Government Code Section 65302 (f)). The State, recognizing the effects of noise upon people's health and well being, required that local jurisdictions prepare statements of policy indicating their intentions regarding noise and noise sources, establish desired maximum noise levels according to land use categories, set standards for noise emission from transportation facilities and fixed-point sources, and prepare a program for implementation of noise control measures. Noise Elements are prepared in accordance with Guidelines for the Preparation and Content of Noise Elements of the General Plan published by the California Office of Noise Control in 1976. Those Guidelines are found in Appendix A of the General Plan Guidelines prepared by the State Office of Planning and Research (OPR).

The major purpose of the Noise Element is to: (1) establish reasonable standards for maximum desired noise levels in Kern County, and; (2) develop an implementation program which could effectively deal with the noise problem.

Considerable research has been done to determine the effects of various sound pressure levels on human health and on the successful performance of various human activities. It is known that noises of 120 dB(A) and higher will cause ear pain in most people; much lower levels may have permanent adverse effects on hearing.

The federal standards for industrial safety regulate the amount of time workers may be exposed to sound levels above 90 dB(A). This level was selected on the assumption that inability to hear at frequencies above 2,000 Hz is unimportant to speech communication. Tests show, however, that hearing loss of this extent will have an adverse effect on hearing low-level conversation and on hearing ordinary speech in the presence of background noise levels which commonly occur in everyday listening conditions.

It is desirable to control ambient noise level to reduce the adverse effects of noise. Ambient noise is the all-encompassing noise associated with a given environment; it usually is a composite of sounds from many sources, near and far.

The U.S. Environmental Protection Agency and the California Department of Health have suggested standards for ambient noise. These suggestions have been utilized in developing noise standards in Kern County.

Of primary importance in controlling noise in Kern County is protection of the public health, particularly insuring against hearing loss resulting from community noise. Next in importance is minimization of adverse effects of noise on the economic well-being of the community, and third, minimization of annoyance caused by noise.

Good land use planning should be employed to insure that the quality of the noise environment in Kern County does not deteriorate, and whenever practical be improved. Where noise sensitive uses are proposed, appropriate noise control measures shall be required as a condition of approval for discretionary projects. Measures to control the quality of the noise environment could include architectural design to reduce noise impact, acoustical insulation of exterior walls and construction of sound barriers.

The following major noise sources were considered in the preparation of the Noise Element:

- Highways and freeways
- Primary arterial and major local streets
- Railroad operations
- Aircraft and airport operations
- Local industrial facilities
- Other stationary sources

Railroad noise, although louder than highway noise, generally affects smaller areas. Railroad yards and rail alignments adjacent to residential areas should have noise barriers. Acoustical noise barriers could reduce existing rail noise up to 20 dB (A).

Little can be done to control airport noise. Through Federal standards more rigid noise controls are being required on aircraft. By adjusting the times of arrival and departure, flight patterns, and the time of day that high noise levels occur, noise levels from airports can be made more tolerable.

Noise contours have been prepared for all airports in the County, major railroad and highways within urban areas. Airport noise contours should be used to determine where noise insulation might be required and are located in the Airport Land Use Compatibility Plan (ALUCP). Any new airport or airport extension will be required to provide estimates of noise impact in conjunction with the required Master Plan updates to the ALUCP. The highway noise contours are contained in Appendix G. Noise contours for Interstate 5; State Route 14, 33, 43, 58, 99, 119, 155, 166, 178, 184, 202, 204, 223, and 395 are shown in Appendix G. Noise contours for the AT & SF Railroad, Southern Pacific Railroad, and Sunset Railroad are shown in Appendix G. The highway and railroad contours are not intended to provide distinct boundaries between noise levels, but as approximations of noise levels that can serve as the basis for further studies. As

these studies are completed, noise treatment may be needed to compensate for higher noise levels.

Definitions

1. Community Noise Equivalent Level (CNEL) – A measure of the cumulative noise exposure in the community, with greater weights applied to evening and nighttime periods. For CNEL calculations, day is defined as 7 a.m. to 7 p.m., and this period has a weighting factor of one; evening is 7 p.m. to 10 p.m. and has a weighting factor of three; and night is from 10 p.m. to 7 a.m. and has a weighting factor of ten. Noises occurring at night are given a substantially heavier weight, since for most people, this is the time when noise is most disturbing.
2. Day Night Average Sound Level, Ldn – The same as CNEL except that the evening time period is not considered separately, but instead it is included as part of the daytime period. Noise contours developed using CNEL and Ldn procedures will normally agree within one dB(A), which is an insignificant difference. The Ldn is a computational simplification of the CNEL.

3.2 NOISE SENSITIVE AREAS

The following noise sensitive land uses have been identified in the County:

- Residential areas
- Schools
- Convalescent and acute care hospitals
- Parks and recreational areas
- Churches

Goals

- 1) Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.
- 2) Protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.

Policies

- 1) Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.
- 2) Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of the California Division of Occupational Safety and Health (DOSH).
- 3) Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.
- 4) Utilize good land use planning principles to reduce conflicts related to noise emissions.
- 5) Prohibit new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design. Such mitigation shall be designed to reduce noise to the following levels:
 - a) 65 dB L_{dn} or less in outdoor activity areas;
 - b) 45 dB L_{dn} or less within interior living spaces or other noise sensitive interior spaces.

- 6) Ensure that new development in the vicinity of airports will be compatible with existing and projected airport noise levels as set forth in the ALUCP.
- 7) Employ the best available methods of noise control.
- 8) Enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code concerning the construction of new multiple-occupancy dwellings such as hotels, apartments, and condominiums.

Implementation Measures

The following are programs to be carried out by the Kern County to implement the goals and policies of the Noise Element.

- A) Utilize zoning regulations to assist in achieving noise-compatible land use patterns.
- B) Require proper acoustical treatment of transportation facilities, including highways, airports, and railroads.
- C) Review discretionary development plans, programs and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policies outlined in this element.
- D) Review discretionary development plans for proposed residential or other noise sensitive land uses in noise-impacted areas to ensure their conformance with the noise standards of 65 dB L_{dn} or less in outdoor activity areas and 45 dB L_{dn} or less within interior living spaces.
- E) Review discretionary development plans to ensure compatibility with adopted Airport Land Use Compatibility Plans.
- F) Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB L_{dn} and interior noise levels in excess of 45 dB L_{dn} .
- G) At the time of any discretionary approval, such as a request for a General Plan Amendment, zone change or subdivision, the developer may be required to submit an acoustical report indicating the means by which the developer proposes to comply with the noise standards. The acoustical report shall:
 - a) Be the responsibility of the applicant.

- b) Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.
 - c) Be subject to the review and approval of the Kern County Planning Department and the Environmental Health Services Department. All recommendations therein shall be complied with prior to final approval of the project.
- H) Encourage cooperation between the County and the incorporated cities within the County to control noise.
- I) Noise analyses shall include recommended mitigation, if required, and shall:
- a) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
 - b) Include estimated noise levels, in terms of CNEL, for existing and projected future (10 – 20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
 - c) Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
 - d) Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the project must be provided.
- J) Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the project permitting process.

Attachment 3

Noise and Meteorological Data

North Site X 388,942m Y 3,887,499m NAD 83

Met Data

Noise Data

Date	m/s	fps	Dir	LAS1.00	LAS8.33
9/11/10 14:50	1.68	5.50	90	42.6	37.1
9/11/10 14:40	1.47	4.83	128	41.6	38.9
9/11/10 9:50	3.48	11.40	78	42.2	39.1
9/11/10 14:20	2.49	8.16	208	41.1	39.1
9/11/10 10:10	4.19	13.74	91	41.7	39.5
9/11/10 15:40	2.39	7.85	162	43.5	39.6
9/11/10 9:40	3.92	12.87	77	41.5	39.7
9/11/10 10:30	5.64	18.49	88	42.4	40.0
9/11/10 15:00	3.00	9.86	176	41.8	40.1
9/11/10 9:00	3.62	11.89	64	42.0	40.3
9/11/10 14:30	2.64	8.66	171	42.4	40.3
9/11/10 14:10	2.18	7.16	189	42.4	40.6
9/11/10 15:50	2.85	9.36	221	47.8	40.6
9/10/10 15:00	4.13	13.53	107	44.1	40.7
9/11/10 9:20	4.02	13.19	77	42.9	40.9
9/11/10 8:40	3.07	10.07	77	42.3	41.0
9/9/10 12:10	9.89	32.44	260	44.8	41.1
9/11/10 8:20	3.12	10.23	81	46.1	41.3
9/10/10 9:20	4.22	13.85	73	44.6	41.4
9/8/10 9:50	8.29	27.20	292	46.1	41.5
9/10/10 16:20	4.29	14.07	137	44.6	41.7
9/11/10 8:30	3.07	10.07	80	44.7	41.7
9/10/10 15:10	2.80	9.19	108	47.4	41.9
9/10/10 18:00	2.65	8.68	125	44.1	41.9
9/9/10 11:10	8.92	29.26	257	45.2	42.0
9/11/10 15:30	2.29	7.52	188	45.4	42.1
9/11/10 16:00	3.37	11.06	208	50.2	42.2
9/8/10 9:00	8.04	26.39	296	45.5	42.3
9/9/10 11:00	5.64	18.51	264	47.0	42.6
9/11/10 16:40	4.39	14.41	192	46.2	42.6
9/8/10 10:30	4.44	14.56	322	50.1	42.7
9/11/10 9:10	3.52	11.56	70	44.7	42.7
9/9/10 4:00	4.80	15.75	256	45.3	43.0
9/11/10 11:00	5.79	19.01	91	46.0	43.0
9/8/10 9:40	8.09	26.55	288	46.6	43.1
9/9/10 3:40	4.78	15.69	250	46.9	43.1
9/10/10 10:30	6.38	20.94	68	45.7	43.1
9/11/10 13:30	1.77	5.82	132	44.7	43.1
9/11/10 13:10	3.50	11.48	125	49.1	43.2
9/9/10 12:00	10.14	33.27	254	46.5	43.3
9/10/10 15:30	3.26	10.69	79	46.2	43.3
9/8/10 9:20	8.79	28.83	306	47.1	43.4
9/10/10 9:40	5.36	17.59	67	45.5	43.4
9/11/10 8:10	3.17	10.40	83	45.7	43.4

9/9/10 0:50	4.39	14.39	263	47.4	43.5
9/10/10 10:00	6.08	19.96	60	46.0	43.6
9/10/10 10:20	6.33	20.78	68	46.1	43.6
9/10/10 17:10	3.67	12.05	124	45.9	43.6
9/11/10 11:10	5.79	19.01	94	46.6	43.6
9/11/10 17:50	5.12	16.80	226	47.6	43.6
9/10/10 12:40	4.69	15.39	113	47.4	43.7
9/8/10 8:50	8.66	28.42	294	45.5	43.8
9/10/10 10:10	6.33	20.78	62	47.0	43.8
9/10/10 16:50	2.30	7.54	104	45.4	43.8
9/11/10 15:10	2.29	7.52	225	47.5	43.8
9/11/10 18:20	6.43	21.10	227	45.9	43.8
9/9/10 3:30	5.84	19.15	249	45.6	43.9
9/11/10 18:50	3.73	12.25	288	46.0	43.9
9/9/10 5:20	6.47	21.22	268	47.1	44.0
9/9/10 12:20	9.33	30.62	260	54.4	44.0
9/11/10 16:20	3.83	12.57	199	47.1	44.0
9/11/10 17:20	3.31	10.86	207	46.0	44.0
9/11/10 18:10	6.07	19.91	227	46.0	44.0
9/10/10 2:00	2.53	8.31	295	46.8	44.1
9/10/10 17:50	2.53	8.32	128	46.0	44.1
9/11/10 10:50	6.38	20.94	103	47.9	44.1
9/9/10 5:00	8.98	29.48	267	52.9	44.2
9/10/10 16:30	3.06	10.05	153	60.8	44.2
9/11/10 18:40	4.46	14.64	254	48.5	44.2
9/11/10 19:50	4.47	14.67	257	46.1	44.2
9/8/10 8:30	7.33	24.04	295	46.3	44.3
9/8/10 10:50	8.43	27.65	259	47.7	44.3
9/11/10 18:00	5.86	19.23	222	46.9	44.3
9/8/10 6:10	9.65	31.66	271	46.1	44.4
9/9/10 4:20	5.45	17.89	264	46.9	44.4
9/10/10 14:20	4.42	14.49	119	47.1	44.4
9/11/10 13:00	3.90	12.81	121	51.8	44.4
9/9/10 3:50	5.08	16.68	252	46.5	44.5
9/10/10 17:20	3.05	10.01	110	48.8	44.5
9/11/10 10:00	3.94	12.93	79	54.7	44.5
9/8/10 8:10	6.73	22.09	299	50.4	44.6
9/8/10 9:10	7.84	25.74	302	51.3	44.6
9/9/10 1:10	8.06	26.44	277	49.6	44.6
9/11/10 17:30	3.16	10.35	212	46.3	44.6
9/8/10 7:10	8.81	28.89	285	46.1	44.7
9/9/10 11:20	8.92	29.26	260	52.6	44.7
9/11/10 8:50	3.32	10.88	71	52.5	44.7
9/10/10 9:50	5.61	18.41	64	49.4	44.8
9/10/10 13:30	3.90	12.81	93	47.5	44.8
9/11/10 12:50	2.67	8.77	65	52.4	44.8
9/11/10 11:20	6.20	20.33	67	48.8	44.9

9/11/10 13:40	1.98	6.49	191	48.1	44.9
9/9/10 4:30	6.75	22.15	258	49.2	45.0
9/9/10 11:30	9.83	32.23	254	56.3	45.0
9/10/10 12:50	4.39	14.40	72	47.7	45.1
9/10/10 16:10	2.86	9.38	100	48.1	45.1
9/11/10 18:30	6.02	19.74	233	46.4	45.1
9/9/10 5:30	6.57	21.54	295	49.8	45.3
9/9/10 9:00	2.58	8.47	115	48.0	45.3
9/11/10 15:20	1.02	3.34	207	51.9	45.4
9/8/10 8:00	7.13	23.39	285	55.4	45.5
9/9/10 1:40	5.31	17.41	278	54.0	45.5
9/10/10 13:00	4.41	14.47	58	48.8	45.6
9/11/10 19:30	4.32	14.17	264	47.3	45.6
9/11/10 19:40	4.67	15.33	262	47.8	45.6
9/8/10 8:40	7.33	24.04	294	49.4	45.7
9/11/10 17:40	4.14	13.58	216	47.4	45.7
9/9/10 1:20	7.56	24.80	272	51.4	45.8
9/9/10 10:40	7.63	25.03	264	51.0	45.9
9/10/10 14:40	3.96	12.99	133	47.7	45.9
9/10/10 17:00	3.05	10.01	114	49.0	45.9
9/8/10 5:50	11.01	36.12	271	48.2	46.0
9/10/10 15:20	3.21	10.53	61	48.0	46.0
9/10/10 18:10	2.90	9.53	150	48.7	46.0
9/11/10 13:20	2.99	9.81	134	50.6	46.0
9/8/10 6:00	10.46	34.31	273	49.1	46.1
9/10/10 15:40	4.84	15.87	130	49.6	46.1
9/10/10 17:40	3.21	10.52	130	53.6	46.1
9/8/10 7:40	9.20	30.18	277	49.5	46.2
9/9/10 6:40	7.17	23.53	262	48.6	46.2
9/10/10 3:40	0.50	1.65	72	47.5	46.2
9/11/10 12:00	4.59	15.06	99	50.6	46.2
9/11/10 17:10	4.60	15.10	211	47.3	46.2
9/8/10 8:20	6.68	21.93	295	53.6	46.3
9/9/10 4:50	8.35	27.41	264	50.4	46.3
9/9/10 6:00	7.53	24.70	258	49.6	46.3
9/10/10 13:10	4.06	13.31	59	49.9	46.3
9/8/10 6:20	9.30	30.50	273	48.1	46.4
9/8/10 10:40	8.38	27.49	252	49.3	46.4
9/10/10 15:50	3.82	12.53	108	50.8	46.4
9/8/10 7:50	8.81	28.89	281	49.0	46.5
9/8/10 9:30	8.29	27.20	291	51.5	46.5
9/9/10 6:20	6.01	19.72	260	48.1	46.5
9/10/10 12:10	5.75	18.87	92	49.8	46.5
9/11/10 10:40	5.54	18.16	94	52.0	46.5
9/9/10 6:30	6.92	22.71	260	49.3	46.6
9/9/10 10:10	5.09	16.69	228	52.9	46.6
9/10/10 5:20	0.99	3.24	250	48.5	46.6

9/10/10 13:40	3.40	11.15	85	49.2	46.6
9/10/10 14:50	4.01	13.16	122	48.8	46.6
9/11/10 20:40	3.82	12.54	262	48.8	46.6
9/8/10 5:30	12.19	40.01	270	52.5	46.7
9/9/10 8:10	3.86	12.67	340	48.6	46.7
9/10/10 18:20	2.18	7.15	153	48.2	46.7
9/11/10 14:00	3.35	10.99	168	48.3	46.7
9/9/10 7:20	3.35	10.97	281	48.3	46.8
9/10/10 17:30	2.69	8.83	111	48.2	46.8
9/11/10 21:10	3.52	11.54	260	48.5	46.8
9/8/10 5:40	10.96	35.96	270	48.7	46.9
9/8/10 11:30	9.17	30.09	271	54.1	46.9
9/9/10 6:50	5.81	19.06	274	48.3	46.9
9/10/10 12:20	3.99	13.07	75	50.9	46.9
9/11/10 19:00	4.27	14.00	289	48.3	46.9
9/10/10 2:10	1.37	4.49	198	50.1	47.0
9/10/10 18:30	0.83	2.72	234	49.4	47.0
9/8/10 5:20	12.34	40.49	273	50.4	47.1
9/9/10 1:00	6.86	22.50	270	50.5	47.1
9/9/10 6:10	6.82	22.37	264	48.8	47.1
9/10/10 2:30	0.41	1.33	222	50.6	47.1
9/8/10 5:10	12.64	41.46	271	50.0	47.2
9/9/10 5:40	5.97	19.60	259	52.1	47.2
9/10/10 14:30	4.77	15.66	137	53.0	47.2
9/9/10 0:30	5.47	17.94	280	50.2	47.3
9/10/10 5:50	0.49	1.62	233	48.9	47.3
9/11/10 21:40	4.42	14.50	259	48.9	47.3
9/8/10 21:30	6.83	22.41	275	54.9	47.4
9/9/10 11:40	9.93	32.57	263	50.9	47.4
9/10/10 12:30	5.30	17.38	108	51.5	47.4
9/11/10 12:40	2.12	6.95	41	52.2	47.4
9/8/10 23:30	7.37	24.18	246	53.7	47.5
9/9/10 5:10	8.15	26.72	272	55.3	47.5
9/10/10 8:50	3.61	11.86	76	51.6	47.5
9/9/10 3:20	6.59	21.63	247	53.2	47.6
9/9/10 7:10	2.26	7.42	355	56.4	47.6
9/9/10 8:00	3.37	11.04	247	51.7	47.6
9/10/10 8:30	2.43	7.96	92	48.9	47.6
9/10/10 13:20	2.64	8.65	78	52.8	47.6
9/8/10 5:00	12.49	40.98	272	52.1	47.8
9/8/10 11:00	7.86	25.79	269	56.6	47.8
9/10/10 10:40	6.58	21.60	73	51.0	47.8
9/11/10 11:30	5.84	19.18	103	53.0	47.8
9/11/10 12:20	4.84	15.89	115	52.3	47.8
9/11/10 20:20	3.92	12.87	255	49.6	47.8
9/12/10 1:30	5.66	18.56	246	50.6	47.9
9/9/10 10:50	7.83	25.69	256	53.7	48.0

9/9/10 12:40	8.83	28.96	258	51.4	48.0
9/10/10 3:30	2.16	7.10	73	49.8	48.0
9/11/10 11:40	5.04	16.53	99	57.7	48.0
9/11/10 20:10	4.02	13.20	257	49.6	48.0
9/11/10 12:30	3.58	11.75	123	52.0	48.1
9/8/10 7:20	8.81	28.89	277	50.7	48.2
9/9/10 10:00	4.09	13.42	106	54.5	48.2
9/10/10 20:30	3.72	12.21	300	50.4	48.2
9/11/10 23:30	6.52	21.39	256	50.6	48.2
9/12/10 1:10	5.86	19.21	245	53.0	48.2
9/12/10 6:20	2.48	8.12	236	50.6	48.2
9/10/10 5:40	1.14	3.73	251	50.1	48.3
9/12/10 4:30	5.75	18.87	258	51.1	48.3
9/8/10 6:40	8.28	27.18	268	52.0	48.4
9/10/10 2:20	1.01	3.32	183	51.1	48.4
9/9/10 11:50	9.77	32.07	256	51.1	48.5
9/10/10 19:40	5.59	18.33	296	50.3	48.5
9/11/10 20:00	4.13	13.53	256	52.7	48.5
9/11/10 23:10	5.92	19.41	252	51.9	48.5
9/12/10 4:40	5.70	18.71	257	54.3	48.5
9/8/10 11:40	8.62	28.27	280	57.6	48.6
9/10/10 2:40	0.41	1.33	66	51.9	48.6
9/12/10 0:30	6.50	21.34	257	51.5	48.6
9/9/10 5:50	6.86	22.51	268	50.6	48.7
9/9/10 12:30	8.88	29.13	266	51.8	48.7
9/10/10 1:10	7.26	23.81	298	54.1	48.7
9/10/10 6:00	0.91	2.98	186	50.6	48.7
9/11/10 23:00	6.22	20.40	248	51.1	48.7
9/9/10 10:20	7.93	26.01	240	52.2	48.8
9/10/10 21:10	2.56	8.41	313	51.7	48.8
9/11/10 21:50	3.97	13.02	257	50.5	48.8
9/8/10 21:40	6.53	21.43	268	56.6	48.9
9/10/10 7:50	1.92	6.29	133	50.4	48.9
9/11/10 11:50	4.18	13.72	108	51.8	48.9
9/12/10 2:50	6.18	20.27	258	52.1	48.9
9/10/10 4:10	1.05	3.45	256	53.7	49.0
9/11/10 0:30	3.30	10.83	1	51.1	49.0
9/11/10 7:50	2.71	8.88	68	51.7	49.0
9/11/10 22:00	4.64	15.22	253	50.8	49.0
9/12/10 2:30	6.23	20.44	255	54.0	49.0
9/7/10 13:20	9.79	32.11	281	54.2	49.1
9/8/10 21:50	8.59	28.18	265	53.2	49.1
9/10/10 12:00	4.84	15.89	75	53.1	49.1
9/10/10 19:10	3.40	11.17	288	50.1	49.1
9/11/10 6:50	2.12	6.96	84	52.6	49.1
9/11/10 20:30	3.82	12.54	262	52.4	49.1
9/8/10 7:00	9.30	30.50	273	51.9	49.2

9/9/10 4:40	7.55	24.78	268	51.1	49.2
9/10/10 20:20	4.28	14.03	296	51.4	49.2
9/10/10 6:20	0.66	2.15	21	50.7	49.3
9/12/10 3:20	5.84	19.15	249	53.1	49.3
9/9/10 8:30	9.65	31.67	299	54.1	49.4
9/11/10 16:10	1.28	4.19	174	53.3	49.4
9/11/10 22:10	4.74	15.55	259	51.6	49.4
9/10/10 23:30	3.91	12.83	338	51.9	49.5
9/11/10 6:30	2.27	7.46	63	51.6	49.5
9/11/10 23:20	6.42	21.06	253	52.2	49.5
9/12/10 0:20	6.01	19.72	257	51.9	49.5
9/9/10 7:00	4.28	14.04	269	54.1	49.6
9/9/10 7:30	7.48	24.53	278	55.6	49.6
9/11/10 22:50	6.05	19.85	249	51.9	49.6
9/12/10 5:30	4.44	14.58	247	55.6	49.6
9/12/10 6:00	0.40	1.33	153	54.8	49.6
9/8/10 22:50	7.16	23.49	253	53.4	49.7
9/10/10 19:30	4.93	16.17	292	51.7	49.7
9/10/10 20:10	4.63	15.18	298	51.4	49.7
9/11/10 0:10	3.40	11.15	351	51.8	49.7
9/11/10 21:30	4.02	13.18	260	52.5	49.7
9/10/10 8:10	2.03	6.66	98	58.0	49.8
9/10/10 11:50	4.89	16.03	66	53.5	49.8
9/10/10 21:50	3.06	10.05	333	51.2	49.8
9/10/10 23:40	3.51	11.52	339	52.7	49.8
9/11/10 21:20	3.57	11.70	259	52.6	49.8
9/12/10 0:10	6.31	20.69	257	52.7	49.8
9/12/10 4:20	5.50	18.05	256	54.6	49.8
9/10/10 5:30	0.54	1.78	258	51.9	49.9
9/10/10 6:30	0.40	1.33	7	51.6	49.9
9/10/10 20:40	3.07	10.07	306	51.3	49.9
9/11/10 5:50	0.30	0.97	237	51.8	49.9
9/11/10 6:20	2.53	8.29	44	53.5	49.9
9/10/10 7:40	0.64	2.10	156	52.2	50.0
9/12/10 1:50	6.11	20.04	250	52.2	50.0
9/9/10 9:30	6.80	22.32	325	52.8	50.1
9/9/10 12:50	9.64	31.61	255	53.3	50.1
9/10/10 1:40	4.35	14.29	297	51.8	50.1
9/10/10 8:00	1.98	6.50	115	55.0	50.1
9/10/10 8:40	2.72	8.93	85	51.9	50.1
9/12/10 5:40	1.53	5.02	178	52.5	50.1
9/12/10 5:50	0.39	1.30	157	52.3	50.1
9/8/10 11:20	9.02	29.59	272	55.8	50.2
9/10/10 21:00	2.56	8.41	312	55.4	50.2
9/10/10 21:40	3.22	10.55	319	57.1	50.2
9/10/10 22:40	3.68	12.08	336	52.8	50.2
9/12/10 5:20	4.69	15.39	251	52.5	50.2

9/8/10 4:50	13.06	42.83	269	56.5	50.3
9/8/10 20:00	4.23	13.86	269	57.1	50.3
9/8/10 20:30	5.33	17.50	268	55.0	50.3
9/9/10 0:40	3.40	11.15	251	53.9	50.3
9/9/10 3:10	6.69	21.96	249	53.6	50.3
9/9/10 9:10	4.17	13.68	268	56.5	50.3
9/11/10 4:30	4.05	13.29	34	53.3	50.3
9/11/10 12:10	3.73	12.25	117	53.7	50.3
9/10/10 1:50	2.95	9.69	302	53.5	50.4
9/10/10 23:50	3.31	10.86	349	52.8	50.4
9/11/10 6:40	2.27	7.46	80	52.4	50.4
9/11/10 7:00	1.97	6.46	80	55.4	50.4
9/11/10 8:00	3.07	10.07	76	52.5	50.4
9/12/10 1:20	6.06	19.87	247	53.1	50.4
9/8/10 23:20	5.92	19.41	235	55.4	50.5
9/10/10 3:50	0.50	1.65	128	52.1	50.5
9/10/10 19:20	4.01	13.17	295	52.9	50.5
9/10/10 21:20	2.81	9.23	316	51.8	50.5
9/9/10 9:40	5.21	17.10	320	54.7	50.6
9/10/10 2:50	1.01	3.32	228	55.3	50.6
9/10/10 4:50	1.25	4.10	245	55.5	50.6
9/10/10 10:50	6.18	20.29	73	54.1	50.6
9/10/10 11:00	6.55	21.49	71	55.3	50.6
9/11/10 22:20	4.94	16.21	261	54.2	50.6
9/9/10 1:50	5.16	16.91	279	55.2	50.7
9/10/10 4:00	1.25	4.10	219	52.9	50.7
9/10/10 6:10	1.06	3.48	131	53.1	50.7
9/10/10 20:50	2.47	8.09	310	55.0	50.7
9/10/10 22:30	3.43	11.25	340	52.1	50.7
9/8/10 10:00	8.88	29.12	294	53.2	50.8
9/11/10 0:20	3.35	10.99	353	53.3	50.8
9/11/10 1:00	3.05	10.02	4	52.5	50.8
9/11/10 22:30	5.14	16.88	258	52.2	50.8
9/12/10 5:00	4.94	16.20	248	53.8	50.8
9/10/10 11:30	6.20	20.33	94	54.7	50.9
9/10/10 21:30	2.91	9.56	317	53.8	50.9
9/11/10 3:40	4.48	14.70	33	52.9	50.9
9/12/10 3:30	5.33	17.50	249	53.0	50.9
9/7/10 13:40	9.33	30.61	286	55.2	51.0
9/8/10 23:50	6.52	21.39	267	56.8	51.0
9/9/10 9:50	3.87	12.70	355	53.6	51.0
9/10/10 7:20	0.54	1.78	96	53.4	51.0
9/11/10 6:10	2.07	6.80	36	54.9	51.0
9/12/10 5:10	4.49	14.74	252	53.7	51.0
9/7/10 14:10	9.09	29.81	282	54.7	51.1
9/10/10 8:20	1.98	6.50	86	55.3	51.1
9/11/10 3:30	4.48	14.70	31	53.6	51.1

9/7/10 14:20	9.90	32.48	288	54.3	51.2
9/8/10 6:30	8.64	28.34	273	61.3	51.2
9/9/10 2:20	4.96	16.28	253	54.2	51.2
9/10/10 0:30	6.55	21.50	291	54.5	51.2
9/10/10 14:00	1.83	6.00	59	53.9	51.2
9/11/10 0:00	3.55	11.64	349	54.7	51.2
9/11/10 3:00	4.13	13.54	22	53.7	51.2
9/11/10 4:50	4.05	13.29	41	53.0	51.2
9/11/10 23:40	6.92	22.70	258	52.9	51.2
9/7/10 13:50	8.97	29.44	281	56.0	51.3
9/10/10 19:00	3.05	10.00	280	53.8	51.3
9/11/10 1:10	3.35	11.00	1	54.1	51.3
9/11/10 5:00	3.90	12.80	42	55.3	51.3
9/11/10 6:00	0.81	2.65	324	55.1	51.3
9/12/10 3:00	5.94	19.48	255	57.0	51.3
9/10/10 16:00	3.63	11.90	105	56.5	51.4
9/10/10 22:00	3.13	10.26	334	54.1	51.4
9/11/10 5:30	0.35	1.13	105	53.8	51.4
9/8/10 20:40	4.78	15.68	270	54.8	51.5
9/10/10 18:50	2.59	8.51	280	53.9	51.5
9/11/10 22:40	5.14	16.88	246	54.0	51.5
9/10/10 9:30	4.72	15.47	66	60.3	51.6
9/10/10 11:20	5.84	19.18	83	54.9	51.6
9/11/10 13:50	2.74	8.98	122	54.9	51.6
9/8/10 23:40	8.52	27.97	259	58.4	51.7
9/9/10 0:00	4.53	14.87	273	58.4	51.7
9/9/10 0:20	4.34	14.23	275	59.1	51.7
9/9/10 10:30	7.83	25.69	252	54.9	51.7
9/8/10 23:00	6.07	19.91	244	57.9	51.8
9/10/10 7:30	0.69	2.26	120	53.7	51.8
9/11/10 5:10	2.02	6.64	40	53.6	51.8
9/11/10 9:30	3.77	12.38	56	61.2	51.8
9/8/10 20:50	5.38	17.66	264	55.8	51.9
9/11/10 1:30	3.35	11.00	358	54.4	51.9
9/11/10 3:50	4.43	14.53	32	54.7	51.9
9/11/10 5:40	0.30	0.97	172	54.3	51.9
9/10/10 3:20	2.82	9.25	83	58.2	52.0
9/10/10 6:50	1.01	3.31	100	53.1	52.0
9/10/10 16:40	4.14	13.57	96	55.9	52.0
9/10/10 23:20	4.21	13.82	333	55.3	52.0
9/11/10 3:10	4.23	13.87	20	53.9	52.0
9/11/10 7:20	2.66	8.71	76	54.2	52.0
9/10/10 23:10	4.31	14.15	330	54.0	52.1
9/11/10 2:50	4.05	13.29	24	55.0	52.1
9/8/10 21:00	6.53	21.43	271	57.9	52.2
9/11/10 2:10	3.75	12.30	14	55.9	52.2
9/11/10 3:20	4.18	13.71	29	55.4	52.2

9/8/10 11:50	8.57	28.10	288	59.0	52.3
9/8/10 22:10	7.77	25.48	250	56.0	52.3
9/10/10 14:10	4.06	13.32	91	57.2	52.3
9/11/10 2:00	3.49	11.47	11	57.3	52.3
9/11/10 2:40	3.75	12.30	20	54.4	52.3
9/11/10 7:30	2.21	7.26	81	54.3	52.3
9/8/10 20:20	7.45	24.43	283	58.4	52.4
9/9/10 1:30	4.91	16.09	279	57.0	52.5
9/11/10 17:00	4.71	15.44	200	57.9	52.5
9/8/10 19:50	5.89	19.33	258	56.2	52.6
9/10/10 4:40	0.55	1.81	255	56.3	52.6
9/10/10 9:10	4.17	13.68	80	68.9	52.6
9/10/10 11:40	4.89	16.03	89	55.8	52.6
9/10/10 1:30	5.41	17.74	293	56.2	52.7
9/11/10 7:40	2.66	8.71	71	55.6	52.7
9/11/10 16:30	4.49	14.74	201	55.1	52.7
9/11/10 0:40	3.20	10.51	1	57.5	52.8
9/11/10 20:50	3.72	12.21	258	62.5	52.8
9/9/10 7:40	7.62	25.01	273	59.1	52.9
9/9/10 0:10	2.91	9.54	265	60.3	53.0
9/7/10 14:00	9.39	30.81	280	55.7	53.1
9/9/10 2:30	6.53	21.44	262	57.4	53.1
9/12/10 1:40	5.51	18.06	248	56.6	53.1
9/9/10 2:50	7.14	23.43	258	58.0	53.2
9/9/10 3:00	7.00	22.95	253	57.7	53.2
9/10/10 0:00	3.01	9.86	317	59.2	53.2
9/10/10 6:40	0.40	1.33	23	54.8	53.2
9/10/10 7:00	0.79	2.58	117	60.0	53.3
9/10/10 4:30	0.75	2.46	260	57.9	53.4
9/12/10 0:40	6.50	21.34	248	54.7	53.4
9/7/10 15:10	11.41	37.43	280	57.9	53.6
9/8/10 10:20	8.53	27.98	308	62.9	53.6
9/8/10 21:10	7.23	23.73	273	62.6	53.6
9/10/10 5:10	1.58	5.18	269	57.0	53.6
9/10/10 13:50	2.54	8.32	118	73.4	53.6
9/11/10 7:10	1.87	6.13	77	56.1	53.6
9/11/10 10:20	4.24	13.91	106	63.6	53.6
9/11/10 16:50	3.98	13.07	209	57.3	53.6
9/9/10 2:00	4.51	14.79	269	57.7	53.7
9/10/10 9:00	3.72	12.22	79	57.9	53.7
9/8/10 13:50	12.57	41.25	266	57.1	53.8
9/11/10 1:20	3.40	11.17	1	57.5	53.8
9/12/10 4:10	5.30	17.40	254	57.3	53.9
9/7/10 15:00	11.05	36.26	282	59.2	54.0
9/8/10 7:30	7.58	24.85	273	56.9	54.0
9/10/10 0:20	5.57	18.27	297	57.5	54.0
9/7/10 15:30	11.10	36.43	283	56.6	54.1

9/9/10 4:10	5.00	16.41	253	59.3	54.1
9/10/10 19:50	5.33	17.50	300	56.6	54.1
9/11/10 2:30	3.95	12.96	13	56.3	54.1
9/10/10 18:40	1.40	4.59	284	57.1	54.2
9/7/10 13:30	9.13	29.94	292	56.7	54.3
9/8/10 10:10	8.43	27.65	299	59.8	54.3
9/11/10 0:50	3.10	10.18	5	57.3	54.3
9/8/10 21:20	7.38	24.23	270	57.8	54.4
9/8/10 22:20	8.07	26.47	249	59.0	54.4
9/10/10 22:20	3.08	10.09	340	57.9	54.4
9/9/10 9:20	5.46	17.92	272	59.3	54.5
9/7/10 14:40	11.42	37.47	284	59.8	54.6
9/12/10 3:40	5.08	16.68	248	56.3	54.6
9/8/10 18:00	11.05	36.25	285	58.6	54.8
9/10/10 1:20	6.51	21.35	296	58.5	54.8
9/10/10 11:10	6.25	20.50	84	63.0	54.8
9/10/10 23:00	4.16	13.65	329	59.6	54.8
9/10/10 0:10	2.66	8.73	339	61.5	55.0
9/8/10 4:40	12.96	42.50	268	58.7	55.1
9/8/10 22:40	7.56	24.82	246	58.7	55.1
9/9/10 8:20	8.22	26.96	313	60.3	55.1
9/7/10 16:20	12.77	41.88	286	57.6	55.2
9/8/10 11:10	8.62	28.27	274	61.5	55.2
9/8/10 22:30	8.27	27.13	248	64.3	55.2
9/9/10 2:40	7.75	25.42	257	58.9	55.2
9/10/10 3:10	1.86	6.11	46	58.7	55.2
9/7/10 15:20	10.54	34.59	283	58.7	55.3
9/9/10 2:10	5.82	19.11	274	58.1	55.3
9/10/10 4:20	0.60	1.97	259	59.2	55.3
9/12/10 2:00	5.37	17.61	254	57.0	55.3
9/7/10 15:40	11.66	38.26	284	59.4	55.4
9/7/10 16:30	12.10	39.71	285	57.8	55.4
9/8/10 2:20	9.17	30.08	274	58.9	55.4
9/8/10 13:40	11.41	37.43	267	58.9	55.4
9/10/10 0:40	6.75	22.15	292	60.0	55.4
9/10/10 22:50	4.34	14.23	331	57.7	55.5
9/8/10 23:10	5.27	17.27	238	61.3	55.6
9/8/10 19:20	6.35	20.83	225	62.2	55.7
9/10/10 3:00	1.16	3.80	314	58.1	55.7
9/10/10 1:00	6.96	22.83	288	59.9	55.8
9/12/10 1:00	6.31	20.69	245	60.7	55.8
9/12/10 2:10	6.18	20.27	257	57.4	55.8
9/11/10 23:50	6.82	22.37	260	59.7	55.9
9/8/10 13:10	12.47	40.92	275	59.4	56.0
9/10/10 20:00	5.03	16.50	299	58.7	56.0
9/8/10 13:20	12.42	40.76	275	58.7	56.1
9/8/10 19:30	5.54	18.17	241	60.4	56.1

9/7/10 16:10	13.17	43.22	289	59.6	56.2
9/7/10 14:50	11.12	36.47	287	61.5	56.4
9/7/10 16:00	12.87	42.22	286	59.7	56.4
9/10/10 5:00	1.97	6.48	273	59.4	56.4
9/11/10 19:10	5.44	17.83	275	58.4	56.4
9/8/10 13:30	10.80	35.43	270	59.3	56.5
9/10/10 0:50	6.36	20.85	293	60.7	56.5
9/12/10 3:50	5.44	17.83	253	59.2	56.5
9/8/10 6:50	8.54	28.01	271	60.3	56.7
9/11/10 2:20	3.85	12.63	11	60.3	56.7
9/7/10 13:10	7.91	25.95	293	64.7	56.8
9/8/10 4:30	12.16	39.88	269	60.2	56.8
9/10/10 7:10	0.74	2.42	109	60.0	56.8
9/8/10 18:10	8.35	27.40	279	60.1	56.9
9/7/10 17:10	12.31	40.39	289	60.3	57.0
9/7/10 16:40	11.34	37.19	289	61.4	57.1
9/11/10 5:20	0.94	3.08	54	61.9	57.1
9/12/10 0:50	6.70	21.99	246	62.8	57.1
9/8/10 20:10	5.38	17.66	276	61.2	57.4
9/7/10 17:00	12.05	39.54	293	60.1	57.6
9/8/10 19:10	5.18	17.00	244	62.4	57.6
9/11/10 4:20	4.10	13.46	33	59.2	57.6
9/8/10 17:50	11.95	39.20	288	62.4	57.7
9/8/10 18:20	8.97	29.44	280	60.1	57.7
9/7/10 15:50	12.58	41.27	282	63.7	57.8
9/8/10 14:00	13.30	43.64	278	62.4	57.8
9/9/10 7:50	3.89	12.75	249	62.5	57.8
9/7/10 14:30	10.00	32.81	286	60.8	57.9
9/11/10 19:20	5.38	17.67	274	60.1	57.9
9/7/10 16:50	12.20	40.04	289	60.6	58.1
9/8/10 18:40	6.95	22.80	259	61.5	58.1
9/11/10 4:40	3.85	12.64	37	61.6	58.1
9/11/10 21:00	3.06	10.05	269	63.8	58.2
9/8/10 1:50	9.16	30.05	271	62.4	58.3
9/8/10 22:00	8.22	26.97	262	61.6	58.3
9/8/10 12:00	7.67	25.16	284	63.0	58.8
9/8/10 17:30	12.26	40.22	288	65.1	58.8
9/8/10 17:40	12.47	40.90	292	62.0	58.8
9/8/10 18:30	9.80	32.16	272	61.7	58.8
9/12/10 4:00	5.40	17.72	253	62.2	58.8
9/11/10 4:10	4.10	13.46	30	62.2	58.9
9/8/10 14:20	14.37	47.13	288	63.9	59.1
9/8/10 16:10	15.78	51.77	277	62.5	59.3
9/10/10 22:10	3.28	10.75	333	60.9	59.3
9/11/10 1:40	3.40	11.17	2	63.2	59.4
9/8/10 14:10	13.25	43.47	282	62.2	59.5
9/8/10 18:50	5.86	19.23	253	62.7	59.5

9/8/10 19:00	7.26	23.83	244	62.3	59.5
9/11/10 4:00	4.30	14.11	25	64.1	59.5
9/8/10 2:00	10.94	35.89	265	64.0	59.9
9/7/10 17:20	13.09	42.94	289	62.5	60.1
9/8/10 12:40	12.26	40.22	270	63.3	60.1
9/8/10 13:00	11.61	38.09	273	63.0	60.2
9/8/10 14:30	14.93	48.97	278	64.4	60.2
9/8/10 1:40	9.66	31.69	272	64.6	60.3
9/8/10 12:10	10.64	34.92	267	64.7	60.3
9/12/10 2:40	5.77	18.94	257	63.5	60.3
9/7/10 17:50	14.48	47.52	286	62.6	60.5
9/8/10 19:40	6.60	21.67	255	64.3	60.6
9/12/10 4:50	5.70	18.71	251	65.3	60.7
9/7/10 17:30	13.14	43.11	288	62.5	60.8
9/8/10 14:40	13.61	44.64	275	63.5	60.8
9/8/10 4:20	13.06	42.83	271	63.3	60.9
9/8/10 15:00	15.74	51.63	275	63.6	61.0
9/12/10 6:10	1.01	3.31	193	65.5	61.0
9/7/10 17:40	13.24	43.45	283	63.6	61.1
9/8/10 2:30	7.14	23.43	281	65.0	61.1
9/8/10 12:50	11.96	39.22	272	64.8	61.1
9/8/10 15:20	15.18	49.79	281	64.4	61.2
9/12/10 3:10	6.34	20.81	252	63.8	61.2
9/8/10 4:10	13.16	43.16	274	63.6	61.3
9/8/10 15:10	14.36	47.12	281	64.5	61.3
9/7/10 18:20	14.11	46.29	285	63.7	61.5
9/7/10 19:30	12.70	41.67	294	63.6	61.5
9/8/10 1:20	10.86	35.64	265	65.3	61.5
9/8/10 2:50	12.21	40.05	271	63.6	61.5
9/7/10 19:40	13.82	45.33	294	64.5	61.6
9/8/10 1:30	10.76	35.31	269	64.8	61.6
9/8/10 16:50	14.76	48.42	281	65.0	61.7
9/8/10 17:20	12.00	39.37	286	65.3	61.8
9/7/10 22:20	11.45	37.56	266	64.4	61.9
9/8/10 3:40	12.23	40.12	281	66.1	61.9
9/8/10 12:30	11.91	39.06	267	65.3	61.9
9/8/10 14:50	14.98	49.13	273	64.6	61.9
9/7/10 20:50	12.98	42.58	279	65.1	62.1
9/7/10 21:30	11.75	38.57	269	64.2	62.1
9/8/10 2:40	9.02	29.58	274	65.8	62.1
9/8/10 3:00	11.83	38.80	276	64.7	62.1
9/8/10 4:00	13.21	43.32	282	65.2	62.1
9/7/10 22:30	12.31	40.37	254	65.1	62.3
9/8/10 12:20	12.66	41.54	274	64.9	62.3
9/7/10 20:40	13.23	43.41	285	65.0	62.4
9/7/10 21:00	13.76	45.16	282	64.6	62.4
9/7/10 22:00	12.10	39.71	276	64.7	62.6

9/8/10 1:10	11.96	39.25	266	65.5	62.6
9/7/10 18:10	14.37	47.14	287	64.7	62.7
9/8/10 2:10	10.69	35.06	266	67.4	62.7
9/7/10 18:30	14.42	47.31	285	65.1	62.8
9/8/10 15:40	16.45	53.97	276	65.8	62.8
9/7/10 19:50	13.56	44.50	290	65.6	62.9
9/8/10 3:50	12.99	42.60	278	66.4	62.9
9/8/10 15:50	16.04	52.63	281	65.6	62.9
9/7/10 18:00	14.58	47.82	287	65.9	63.0
9/7/10 20:00	13.23	43.41	292	65.2	63.0
9/7/10 20:30	12.22	40.11	284	65.3	63.0
9/12/10 2:20	5.98	19.61	254	66.3	63.0
9/7/10 18:40	13.33	43.74	284	66.1	63.2
9/8/10 17:10	12.98	42.60	284	66.4	63.2
9/7/10 18:50	12.66	41.52	286	65.5	63.3
9/7/10 20:20	12.43	40.77	288	67.1	63.3
9/8/10 1:00	11.26	36.95	275	65.8	63.3
9/8/10 17:00	14.85	48.71	282	65.5	63.3
9/7/10 19:20	13.46	44.17	294	65.9	63.4
9/7/10 22:10	11.95	39.21	271	66.2	63.4
9/9/10 8:50	4.75	15.59	276	68.7	63.4
9/7/10 19:10	12.85	42.17	290	65.6	63.5
9/9/10 8:40	8.27	27.12	291	68.7	63.5
9/7/10 21:50	12.36	40.54	269	66.1	63.6
9/8/10 3:30	12.68	41.61	281	66.1	63.6
9/8/10 15:30	15.53	50.96	274	68.5	63.6
9/8/10 16:20	14.45	47.41	283	66.9	63.6
9/7/10 21:20	12.01	39.39	272	65.5	63.7
9/7/10 21:10	12.76	41.86	279	66.4	63.8
9/7/10 21:40	12.91	42.36	264	65.5	63.8
9/8/10 16:00	16.09	52.77	278	66.8	63.9
9/8/10 16:40	15.98	52.44	285	66.3	64.1
9/8/10 3:10	11.83	38.80	279	66.8	64.2
9/11/10 1:50	3.35	11.00	9	68.4	64.3
9/7/10 19:00	13.00	42.67	290	66.4	64.5
9/7/10 22:40	14.12	46.33	249	67.1	64.5
9/8/10 0:50	11.28	37.02	275	66.9	64.5
9/8/10 16:30	13.84	45.40	279	68.6	64.6
9/7/10 22:50	13.67	44.84	252	68.0	64.8
9/8/10 0:40	11.48	37.67	280	67.7	65.0
9/7/10 23:00	12.34	40.47	255	67.3	65.5
9/8/10 3:20	12.13	39.79	279	67.7	65.5
9/7/10 20:10	12.63	41.43	289	68.8	65.8
9/7/10 23:40	12.44	40.80	275	68.5	65.8
9/8/10 0:30	11.38	37.34	278	69.0	66.0
9/7/10 23:30	12.39	40.63	274	68.6	66.5
9/7/10 23:50	11.38	37.34	273	69.2	67.0

9/8/10 0:20	10.59	34.76	281	69.3	67.0
9/7/10 23:10	12.89	42.28	256	70.5	67.7
9/7/10 23:20	13.04	42.77	268	70.0	67.7
9/8/10 0:10	11.09	36.37	282	71.0	68.0
9/8/10 0:00	12.12	39.77	278	71.0	68.3

South Site X 387,115m Y 3,882,694m NAD 83

Met Data

Noise Data

Time Stamp	m/s	fps	Dir	LAS1.00	LAS8.33
9/7/10 11:50	4.74	15.54	203	63.4	57.2
9/7/10 12:00	7.82	25.65	225	38.3	34.5
9/7/10 12:10	7.57	24.83	209	54.8	42.4
9/7/10 12:20	7.47	24.49	229	43.2	40.9
9/7/10 12:30	7.77	25.49	271	52.4	38.7
9/7/10 12:40	6.56	21.52	249	41.4	34.9
9/7/10 12:50	5.85	19.20	262	51.3	40.9
9/7/10 13:00	7.71	25.28	255	38.0	35.7
9/7/10 13:10	7.91	25.95	293	56.2	51.2
9/7/10 13:20	9.79	32.11	281	54.9	50.8
9/7/10 13:30	9.13	29.94	292	58.3	54.2
9/7/10 13:40	9.33	30.61	286	61.9	55.9
9/7/10 13:50	8.97	29.44	281	59.5	55.1
9/7/10 14:00	9.39	30.81	280	59.9	56.7
9/7/10 14:10	9.09	29.81	282	58.4	55.6
9/7/10 14:20	9.90	32.48	288	60.5	56.6
9/7/10 14:30	10.00	32.81	286	66.8	60.3
9/7/10 14:40	11.42	37.47	284	62.6	57.1
9/7/10 14:50	11.12	36.47	287	59.9	55.8
9/7/10 15:00	11.05	36.26	282	58.7	56.3
9/7/10 15:10	11.41	37.43	280	58.1	56.0
9/7/10 15:20	10.54	34.59	283	59.5	56.3
9/7/10 15:30	11.10	36.43	283	60.3	57.5
9/7/10 15:40	11.66	38.26	284	59.1	56.8
9/7/10 15:50	12.58	41.27	282	61.3	59.1
9/7/10 16:00	12.87	42.22	286	60.4	57.4
9/7/10 16:10	13.17	43.22	289	62.0	59.0
9/7/10 16:20	12.77	41.88	286	60.4	57.7
9/7/10 16:30	12.10	39.71	285	60.0	58.2
9/7/10 16:40	11.34	37.19	289	61.3	58.2
9/7/10 16:50	12.20	40.04	289	62.3	58.9
9/7/10 17:00	12.05	39.54	293	62.2	59.4
9/7/10 17:10	12.31	40.39	289	63.0	59.7
9/7/10 17:20	13.09	42.94	289	65.1	60.9
9/7/10 17:30	13.14	43.11	288	64.3	60.8
9/7/10 17:40	13.24	43.45	283	64.0	60.4
9/7/10 17:50	14.48	47.52	286	63.8	60.5
9/7/10 18:00	14.58	47.82	287	63.1	60.8
9/7/10 18:10	14.37	47.14	287	64.0	60.5
9/7/10 18:20	14.11	46.29	285	63.0	60.2
9/7/10 18:30	14.42	47.31	285	61.8	59.1
9/7/10 18:40	13.33	43.74	284	66.3	62.7
9/7/10 18:50	12.66	41.52	286	65.0	62.4
9/7/10 19:00	13.00	42.67	290	63.7	61.2

9/7/10 19:10	12.85	42.17	290	62.7	59.9
9/7/10 19:20	13.46	44.17	294	61.3	59.1
9/7/10 19:30	12.70	41.67	294	62.0	59.1
9/7/10 19:40	13.82	45.33	294	61.2	57.2
9/7/10 19:50	13.56	44.50	290	61.9	59.1
9/7/10 20:00	13.23	43.41	292	60.0	57.0
9/7/10 20:10	12.63	41.43	289	64.9	61.1
9/7/10 20:20	12.43	40.77	288	61.6	58.5
9/7/10 20:30	12.22	40.11	284	64.7	61.7
9/7/10 20:40	13.23	43.41	285	65.2	62.3
9/7/10 20:50	12.98	42.58	279	64.1	60.4
9/7/10 21:00	13.76	45.16	282	63.8	61.0
9/7/10 21:10	12.76	41.86	279	62.4	60.0
9/7/10 21:20	12.01	39.39	272	63.8	61.2
9/7/10 21:30	11.75	38.57	269	64.1	61.1
9/7/10 21:40	12.91	42.36	264	63.3	61.1
9/7/10 21:50	12.36	40.54	269	64.6	61.9
9/7/10 22:00	12.10	39.71	276	63.7	61.4
9/7/10 22:10	11.95	39.21	271	65.3	62.8
9/7/10 22:20	11.45	37.56	266	67.5	64.7
9/7/10 22:30	12.31	40.37	254	68.2	65.8
9/7/10 22:40	14.12	46.33	249	68.4	65.1
9/7/10 22:50	13.67	44.84	252	68.8	66.0
9/7/10 23:00	12.34	40.47	255	68.2	66.5
9/7/10 23:10	12.89	42.28	256	68.4	65.7
9/7/10 23:20	13.04	42.77	268	67.7	65.6
9/7/10 23:30	12.39	40.63	274	67.3	64.9
9/7/10 23:40	12.44	40.80	275	66.8	64.8
9/7/10 23:50	11.38	37.34	273	69.5	65.9
9/8/10 0:00	12.12	39.77	278	67.1	65.0
9/8/10 0:10	11.09	36.37	282	68.8	65.6
9/8/10 0:20	10.59	34.76	281	67.5	64.3
9/8/10 0:30	11.38	37.34	278	69.3	66.6
9/8/10 0:40	11.48	37.67	280	68.1	65.0
9/8/10 0:50	11.28	37.02	275	67.3	64.7
9/8/10 1:00	11.26	36.95	275	69.3	67.1
9/8/10 1:10	11.96	39.25	266	70.5	66.2
9/8/10 1:20	10.86	35.64	265	70.1	67.4
9/8/10 1:30	10.76	35.31	269	68.8	66.8
9/8/10 1:40	9.66	31.69	272	69.9	66.8
9/8/10 1:50	9.16	30.05	271	71.7	67.7
9/8/10 2:00	10.94	35.89	265	68.9	66.0
9/8/10 2:10	10.69	35.06	266	68.2	66.1
9/8/10 2:20	9.17	30.08	274	68.4	66.2
9/8/10 2:30	7.14	23.43	281	68.4	66.2
9/8/10 2:40	9.02	29.58	274	67.7	64.7
9/8/10 2:50	12.21	40.05	271	70.3	65.7

9/8/10 3:00	11.83	38.80	276	69.6	67.7
9/8/10 3:10	11.83	38.80	279	69.5	65.3
9/8/10 3:20	12.13	39.79	279	67.4	64.8
9/8/10 3:30	12.68	41.61	281	69.1	65.0
9/8/10 3:40	12.23	40.12	281	66.5	64.3
9/8/10 3:50	12.99	42.60	278	66.5	65.0
9/8/10 4:00	13.21	43.32	282	68.4	66.3
9/8/10 4:10	13.16	43.16	274	68.0	65.2
9/8/10 4:20	13.06	42.83	271	65.8	63.2
9/8/10 4:30	12.16	39.88	269	67.6	64.6
9/8/10 4:40	12.96	42.50	268	65.7	63.4
9/8/10 4:50	13.06	42.83	269	66.9	64.2
9/8/10 5:00	12.49	40.98	272	67.5	64.2
9/8/10 5:10	12.64	41.46	271	68.7	65.4
9/8/10 5:20	12.34	40.49	273	67.8	64.5
9/8/10 5:30	12.19	40.01	270	64.6	62.6
9/8/10 5:40	10.96	35.96	270	65.6	62.8
9/8/10 5:50	11.01	36.12	271	67.1	63.6
9/8/10 6:00	10.46	34.31	273	67.1	64.5
9/8/10 6:10	9.65	31.66	271	66.1	63.2
9/8/10 6:20	9.30	30.50	273	66.8	64.3
9/8/10 6:30	8.64	28.34	273	66.2	63.5
9/8/10 6:40	8.28	27.18	268	67.4	64.9
9/8/10 6:50	8.54	28.01	271	69.2	65.7
9/8/10 7:00	9.30	30.50	273	68.2	65.2
9/8/10 7:10	8.81	28.89	285	67.3	65.6
9/8/10 7:20	8.81	28.89	277	68.8	65.5
9/8/10 7:30	7.58	24.85	273	68.5	65.3
9/8/10 7:40	9.20	30.18	277	66.4	63.3
9/8/10 7:50	8.81	28.89	281	68.2	64.9
9/8/10 8:00	7.13	23.39	285	68.6	65.3
9/8/10 8:10	6.73	22.09	299	69.2	66.0
9/8/10 8:20	6.68	21.93	295	66.5	64.3
9/8/10 8:30	7.33	24.04	295	68.4	63.9
9/8/10 8:40	7.33	24.04	294	66.2	62.8
9/8/10 8:50	8.66	28.42	294	65.5	62.3
9/8/10 9:00	8.04	26.39	296	64.7	62.0
9/8/10 9:10	7.84	25.74	302	64.5	61.7
9/8/10 9:20	8.79	28.83	306	64.7	61.2
9/8/10 9:30	8.29	27.20	291	62.9	59.7
9/8/10 9:40	8.09	26.55	288	64.2	60.4
9/8/10 9:50	8.29	27.20	292	63.0	59.1
9/8/10 10:00	8.88	29.12	294	64.4	61.5
9/8/10 10:10	8.43	27.65	299	63.8	60.1
9/8/10 10:20	8.53	27.98	308	65.4	62.7
9/8/10 10:30	4.44	14.56	322	66.5	62.7
9/8/10 10:40	8.38	27.49	252	68.9	64.9

9/8/10 10:50	8.43	27.65	259	67.0	64.2
9/8/10 11:00	7.86	25.79	269	68.3	62.4
9/8/10 11:10	8.62	28.27	274	66.1	61.6
9/8/10 11:20	9.02	29.59	272	62.9	60.4
9/8/10 11:30	9.17	30.09	271	62.6	59.6
9/8/10 11:40	8.62	28.27	280	58.8	56.6
9/8/10 11:50	8.57	28.10	288	60.2	56.7
9/8/10 12:00	7.67	25.16	284	62.5	58.2
9/8/10 12:10	10.64	34.92	267	63.6	61.7
9/8/10 12:20	12.66	41.54	274	65.7	62.2
9/8/10 12:30	11.91	39.06	267	66.1	62.5
9/8/10 12:40	12.26	40.22	270	65.8	63.4
9/8/10 12:50	11.96	39.22	272	65.3	62.7
9/8/10 13:00	11.61	38.09	273	67.0	63.6
9/8/10 13:10	12.47	40.92	275	70.1	64.8
9/8/10 13:20	12.42	40.76	275	68.1	64.8
9/8/10 13:30	10.80	35.43	270	67.1	64.5
9/8/10 13:40	11.41	37.43	267	67.3	64.7
9/8/10 13:50	12.57	41.25	266	68.0	65.3
9/8/10 14:00	13.30	43.64	278	67.1	63.7
9/8/10 14:10	13.25	43.47	282	65.3	63.7
9/8/10 14:20	14.37	47.13	288	68.4	65.6
9/8/10 14:30	14.93	48.97	278	66.4	64.2
9/8/10 14:40	13.61	44.64	275	67.9	65.1
9/8/10 14:50	14.98	49.13	273	67.9	63.9
9/8/10 15:00	15.74	51.63	275	67.2	63.9
9/8/10 15:10	14.36	47.12	281	65.8	62.7
9/8/10 15:20	15.18	49.79	281	66.2	63.3
9/8/10 15:30	15.53	50.96	274	65.7	61.7
9/8/10 15:40	16.45	53.97	276	64.7	62.3
9/8/10 15:50	16.04	52.63	281	67.8	65.0
9/8/10 16:00	16.09	52.77	278	68.8	64.4
9/8/10 16:10	15.78	51.77	277	65.2	63.2
9/8/10 16:20	14.45	47.41	283	67.6	64.2
9/8/10 16:30	13.84	45.40	279	68.4	65.4
9/8/10 16:40	15.98	52.44	285	67.6	64.7
9/8/10 16:50	14.76	48.42	281	66.8	64.6
9/8/10 17:00	14.85	48.71	282	65.7	63.6
9/8/10 17:10	12.98	42.60	284	67.2	63.3
9/8/10 17:20	12.00	39.37	286	64.2	60.9
9/8/10 17:30	12.26	40.22	288	62.5	60.4
9/8/10 17:40	12.47	40.90	292	61.6	58.1
9/8/10 17:50	11.95	39.20	288	63.0	58.2
9/8/10 18:00	11.05	36.25	285	60.1	56.8
9/8/10 18:10	8.35	27.40	279	58.3	54.6
9/8/10 18:20	8.97	29.44	280	61.2	55.9
9/8/10 18:30	9.80	32.16	272	62.6	58.8

9/8/10 18:40	6.95	22.80	259	60.2	56.7
9/8/10 18:50	5.86	19.23	253	61.0	57.3
9/8/10 19:00	7.26	23.83	244	56.6	53.3
9/8/10 19:10	5.18	17.00	244	55.6	52.3
9/8/10 19:20	6.35	20.83	225	57.4	54.0
9/8/10 19:30	5.54	18.17	241	57.1	51.1
9/8/10 19:40	6.60	21.67	255	56.0	50.4
9/8/10 19:50	5.89	19.33	258	52.6	48.5
9/8/10 20:00	4.23	13.86	269	47.9	46.3
9/8/10 20:10	5.38	17.66	276	50.9	45.2
9/8/10 20:20	7.45	24.43	283	48.5	44.4
9/8/10 20:30	5.33	17.50	268	59.5	43.5
9/8/10 20:40	4.78	15.68	270	46.4	44.0
9/8/10 20:50	5.38	17.66	264	50.1	44.2
9/8/10 21:00	6.53	21.43	271	52.6	46.5
9/8/10 21:10	7.23	23.73	273	47.3	42.8
9/8/10 21:20	7.38	24.23	270	49.1	46.3
9/8/10 21:30	6.83	22.41	275	52.8	44.6
9/8/10 21:40	6.53	21.43	268	46.7	43.8
9/8/10 21:50	8.59	28.18	265	52.9	48.5
9/8/10 22:00	8.22	26.97	262	56.1	51.2
9/8/10 22:10	7.77	25.48	250	51.5	49.1
9/8/10 22:20	8.07	26.47	249	52.8	50.1
9/8/10 22:30	8.27	27.13	248	51.4	48.0
9/8/10 22:40	7.56	24.82	246	51.9	49.1
9/8/10 22:50	7.16	23.49	253	52.7	49.7
9/8/10 23:00	6.07	19.91	244	52.5	49.4
9/8/10 23:10	5.27	17.27	238	51.0	48.2
9/8/10 23:20	5.92	19.41	235	49.7	47.0
9/8/10 23:30	7.37	24.18	246	50.8	47.7
9/8/10 23:40	8.52	27.97	259	52.3	48.6
9/8/10 23:50	6.52	21.39	267	51.9	47.1
9/9/10 0:00	4.53	14.87	273	50.1	47.7
9/9/10 0:10	2.91	9.54	265	49.6	46.9
9/9/10 0:20	4.34	14.23	275	47.9	46.3
9/9/10 0:30	5.47	17.94	280	48.9	45.8
9/9/10 0:40	3.40	11.15	251	50.6	46.4
9/9/10 0:50	4.39	14.39	263	45.5	44.8
9/9/10 1:00	6.86	22.50	270	49.4	47.1
9/9/10 1:10	8.06	26.44	277	53.0	50.1
9/9/10 1:20	7.56	24.80	272	52.9	48.4
9/9/10 1:30	4.91	16.09	279	55.8	52.6
9/9/10 1:40	5.31	17.41	278	54.1	52.0
9/9/10 1:50	5.16	16.91	279	49.9	46.9
9/9/10 2:00	4.51	14.79	269	50.6	48.0
9/9/10 2:10	5.82	19.11	274	49.1	46.9
9/9/10 2:20	4.96	16.28	253	49.2	46.6

9/9/10 2:30	6.53	21.44	262	52.1	49.1
9/9/10 2:40	7.75	25.42	257	56.6	51.9
9/9/10 2:50	7.14	23.43	258	52.5	49.3
9/9/10 3:00	7.00	22.95	253	50.7	46.7
9/9/10 3:10	6.69	21.96	249	47.5	45.4
9/9/10 3:20	6.59	21.63	247	44.7	43.8
9/9/10 3:30	5.84	19.15	249	48.5	44.5
9/9/10 3:40	4.78	15.69	250	50.2	46.2
9/9/10 3:50	5.08	16.68	252	51.4	47.5
9/9/10 4:00	4.80	15.75	256	48.8	44.8
9/9/10 4:10	5.00	16.41	253	44.1	43.1
9/9/10 4:20	5.45	17.89	264	45.0	43.7
9/9/10 4:30	6.75	22.15	258	42.9	42.1
9/9/10 4:40	7.55	24.78	268	43.7	42.0
9/9/10 4:50	8.35	27.41	264	42.5	41.2
9/9/10 5:00	8.98	29.48	267	51.5	42.5
9/9/10 5:10	8.15	26.72	272	42.3	41.7
9/9/10 5:20	6.47	21.22	268	46.9	42.5
9/9/10 5:30	6.57	21.54	295	41.7	41.3
9/9/10 5:40	5.97	19.60	259	42.1	41.6
9/9/10 5:50	6.86	22.51	268	48.7	42.4
9/9/10 6:00	7.53	24.70	258	41.7	41.3
9/9/10 6:10	6.82	22.37	264	44.7	42.0
9/9/10 6:20	6.01	19.72	260	49.0	42.6
9/9/10 6:30	6.92	22.71	260	46.0	42.0
9/9/10 6:40	7.17	23.53	262	50.3	46.3
9/9/10 6:50	5.81	19.06	274	45.5	44.0
9/9/10 7:00	4.28	14.04	269	47.3	44.1
9/9/10 7:10	2.26	7.42	355	52.0	45.0
9/9/10 7:20	3.35	10.97	281	51.7	45.9
9/9/10 7:30	7.48	24.53	278	48.4	46.5
9/9/10 7:40	7.62	25.01	273	50.3	46.8
9/9/10 7:50	3.89	12.75	249	53.8	49.2
9/9/10 8:00	3.37	11.04	247	56.0	52.1
9/9/10 8:10	3.86	12.67	340	62.9	58.1
9/9/10 8:20	8.22	26.96	313	60.8	56.8
9/9/10 8:30	9.65	31.67	299	61.0	58.5
9/9/10 8:40	8.27	27.12	291	67.2	63.1
9/9/10 8:50	4.75	15.59	276	66.7	60.2
9/9/10 9:00	2.58	8.47	115	63.6	57.3
9/9/10 9:10	4.17	13.68	268	66.7	63.4
9/9/10 9:20	5.46	17.92	272	66.5	62.8
9/9/10 9:30	6.80	22.32	325	65.6	63.1
9/9/10 9:40	5.21	17.10	320	67.0	63.6
9/9/10 9:50	3.87	12.70	355	66.7	63.0
9/9/10 10:00	4.09	13.42	106	65.2	62.8
9/9/10 10:10	5.09	16.69	228	61.9	60.1

9/9/10 10:20	7.93	26.01	240	63.0	60.1
9/9/10 10:30	7.83	25.69	252	61.2	58.3
9/9/10 10:40	7.63	25.03	264	62.5	59.6
9/9/10 10:50	7.83	25.69	256	62.1	59.5
9/9/10 11:00	5.64	18.51	264	60.4	57.3
9/9/10 11:10	8.92	29.26	257	60.4	58.3
9/9/10 11:20	8.92	29.26	260	59.7	57.3
9/9/10 11:30	9.83	32.23	254	60.3	58.0
9/9/10 11:40	9.93	32.57	263	60.0	56.4
9/9/10 11:50	9.77	32.07	256	60.8	57.2
9/9/10 12:00	10.14	33.27	254	60.7	57.6
9/9/10 12:10	9.89	32.44	260	59.7	56.0
9/9/10 12:20	9.33	30.62	260	60.0	57.8
9/9/10 12:30	8.88	29.13	266	60.2	57.2
9/9/10 12:40	8.83	28.96	258	61.4	58.2
9/9/10 12:50	9.64	31.61	255	60.3	57.3

North Site	X 388,905m	Y 3,886,950m	NAD 83			
			Met Data	Noise Data		
Timestamp	m/s	fps	Dir	LA1-1	LA8-1	
3/22/11 8:21		4.7	15.41976	332	62.6	59.1
3/22/11 8:31		4.2	13.77936	260	67.3	63.7
3/22/11 8:41		3.1	10.17048	228	63.3	60.4
3/22/11 8:51		5.6	18.37248	216	66.3	62.2
3/22/11 9:01		5.8	19.02864	218	65.2	62.2
3/22/11 9:11		6	19.6848	215	64	61.7
3/22/11 9:21		4.8	15.74784	238	66.4	63.2
3/22/11 9:31		3.9	12.79512	215	63.8	62.2
3/22/11 9:41		5.2	17.06016	226	65	62.3
3/22/11 9:51		6.4	20.99712	258	66	62
3/22/11 10:01		6.9	22.63752	260	64	61.6
3/22/11 10:11		7.9	25.91832	265	66.7	63.1
3/22/11 10:21		8.1	26.57448	274	64.1	61.4
3/22/11 10:31		9.9	32.47992	288	62.7	60.7
3/22/11 10:41		12	39.3696	297	63.3	60.9
3/22/11 10:51		13.5	44.2908	295	64.2	61.4
3/22/11 11:01		12	39.3696	293	69.7	61.2
3/22/11 11:11		12.2	40.02576	292	62.6	60.1
3/22/11 11:21		11.5	37.7292	290	62.8	60.4
3/22/11 11:31		10.6	34.77648	285	65.8	60.6
3/22/11 11:41		9.6	31.49568	282	64.8	60.6
3/22/11 11:51		8.7	28.54296	284	63.1	59.4
3/22/11 12:01		7.5	24.606	258	59.8	57.2
3/22/11 12:11		5.9	19.35672	265	62.9	59.7
3/22/11 12:21		5.5	18.0444	251	65.1	61.4
3/22/11 12:31		4.8	15.74784	248	63	60.1
3/22/11 12:41		6.4	20.99712	244	64.4	60
3/22/11 12:51		5.6	18.37248	251	64.2	61.2
3/22/11 13:01		5.9	19.35672	249	62.6	59.9
3/22/11 13:11		7.2	23.62176	253	63.2	60.6
3/22/11 13:21		7	22.9656	258	63.3	60.9
3/22/11 13:31		6.9	22.63752	248	66.4	61.1
3/22/11 13:41		7.2	23.62176	247	63.3	59.7
3/22/11 13:51		7.7	25.26216	249	66.3	62.8
3/22/11 14:01		6.4	20.99712	244	63.6	59.9
3/22/11 14:11		6.9	22.63752	247	61.7	59.5
3/22/11 14:21		6.9	22.63752	243	62.6	60
3/22/11 14:31		6.3	20.66904	252	64.3	62
3/22/11 14:41		7.8	25.59024	255	63.3	60.3
3/22/11 14:51		8.6	28.21488	255	61.8	59.8
3/22/11 15:01		8.9	29.19912	253	64.2	60.8
3/22/11 15:11		9.7	31.82376	260	64.1	61.5
3/22/11 15:21		9.8	32.15184	260	64.5	60.6
3/22/11 15:31		9.5	31.1676	259	69.4	61.3

3/22/11 15:41	9.4	30.83952	261	66.2	60.9
3/22/11 15:51	10.8	35.43264	268	62.1	60
3/22/11 16:01	12.9	42.32232	274	76.5	62.6
3/22/11 16:11	10.4	34.12032	276	62.5	60.6
3/22/11 16:21	6.2	20.34096	287	67.3	62.5
3/22/11 16:31	3	9.8424	9	68.2	64.5
3/22/11 16:41	3.3	10.82664	355	63.6	61.6
3/22/11 16:51	2.8	9.18624	53	64	61.5
3/22/11 17:01	3.3	10.82664	31	63.7	61.3
3/22/11 17:11	1.4	4.59312	46	71.2	68
3/22/11 17:21	2.9	9.51432	303	73.8	65.3
3/22/11 17:31	3.5	11.4828	233	64.3	61.6
3/22/11 17:41	3.5	11.4828	240	63.4	61
3/22/11 17:51	3.4	11.15472	245	66.5	61.2
3/22/11 18:01	3.5	11.4828	253	61.6	59.8
3/22/11 18:11	5.1	16.73208	254	68.7	64.3
3/22/11 18:21	6.5	21.3252	266	65	62.8
3/22/11 18:31	5.8	19.02864	256	67.6	62.8
3/22/11 18:41	4.8	15.74784	228	64.4	62.1
3/22/11 18:51	5.5	18.0444	226	66.9	62.2
3/22/11 19:01	2.7	8.85816	270	64.7	62.5
3/22/11 19:11	1.7	5.57736	333	64.2	62.4
3/22/11 19:21	3.1	10.17048	245	66.2	61.7
3/22/11 19:31	3.6	11.81088	224	64.3	61.9
3/22/11 19:41	3.9	12.79512	223	65.8	63.2
3/22/11 19:51	4.1	13.45128	221	69.6	62.9
3/22/11 20:01	5.2	17.06016	218	64.3	62.1
3/22/11 20:11	4.7	15.41976	224	65.2	62.7
3/22/11 20:21	4.6	15.09168	221	70.2	62.4
3/22/11 20:31	3.9	12.79512	203	63.7	61.2
3/22/11 20:41	3.8	12.46704	231	65.1	62.1
3/22/11 20:51	1.9	6.23352	230	72.3	69.6
3/22/11 21:01	1.4	4.59312	285	68.4	65.4
3/22/11 21:11	1.8	5.90544	306	64.2	61.9
3/22/11 21:21	1.8	5.90544	287	64	60.5
3/22/11 21:31	2.8	9.18624	216	63.9	61.3
3/22/11 21:41	1.9	6.23352	240	65.1	62.2
3/22/11 21:51	1.5	4.9212	247	62.3	60.3
3/22/11 22:01	3.1	10.17048	245	64.4	61.4
3/22/11 22:11	3.4	11.15472	238	64.8	62
3/22/11 22:21	1.9	6.23352	249	65.3	61.3
3/22/11 22:31	1.7	5.57736	261	64.1	61.3
3/22/11 22:41	1.9	6.23352	267	63.4	60.6
3/22/11 22:51	1.5	4.9212	266	62.3	59.6
3/22/11 23:01	1.3	4.26504	276	65.6	60
3/22/11 23:11	1.4	4.59312	277	64.5	61.4
3/22/11 23:21	1.8	5.90544	234	63.4	60.7

3/22/11 23:31	2.6	8.53008	232	62.5	60.2
3/22/11 23:41	2.5	8.202	225	63	59.2
3/22/11 23:51	2.8	9.18624	212	69.8	61.4
3/23/11 0:01	2	6.5616	225	71.2	67.9
3/23/11 0:11	3.4	11.15472	239	62.5	60.8
3/23/11 0:21	2.5	8.202	239	61.8	58.2
3/23/11 0:31	3.2	10.49856	231	62.3	59.6
3/23/11 0:41	3.6	11.81088	245	62.6	59
3/23/11 0:51	5.1	16.73208	241	60.2	57.9
3/23/11 1:01	7.4	24.27792	225	71.2	68.9
3/23/11 1:11	3.5	11.4828	243	63.7	60
3/23/11 1:21	1	3.2808	227	64.4	60.7
3/23/11 1:31	2.6	8.53008	237	63.8	61.4
3/23/11 1:41	3.6	11.81088	233	73.1	70.3
3/23/11 1:51	3.2	10.49856	229	63.1	59.7
3/23/11 2:01	3.6	11.81088	235	66.9	62.5
3/23/11 2:11	4.5	14.7636	234	62.5	58.8
3/23/11 2:21	3.4	11.15472	214	70.8	67.1
3/23/11 2:31	2.5	8.202	226	57.8	53.8
3/23/11 2:41	2.9	9.51432	238	65.8	62.9
3/23/11 2:51	1.9	6.23352	238	62.4	60.5
3/23/11 3:01	3.7	12.13896	245	68.1	66.4
3/23/11 3:11	4	13.1232	247	68.3	66.2
3/23/11 3:21	5.3	17.38824	256	62.5	59.6
3/23/11 3:31	4.7	15.41976	230	64.5	62.6
3/23/11 3:41	2.8	9.18624	237	64.4	61
3/23/11 3:51	3.8	12.46704	243	64	60.5
3/23/11 4:01	3.6	11.81088	242	62.3	60.8
3/23/11 4:11	3.3	10.82664	229	67	64.7
3/23/11 4:21	3.4	11.15472	228	64.2	61.6
3/23/11 4:31	3.2	10.49856	221	64.6	61.6
3/23/11 4:41	3.4	11.15472	217	73	66.3
3/23/11 4:51	3.8	12.46704	230	71.1	62.5
3/23/11 5:01	2.2	7.21776	251	62	59.4
3/23/11 5:11	1.2	3.93696	218	63.1	60.9
3/23/11 5:21	1.9	6.23352	226	64.2	61.5
3/23/11 5:31	2.7	8.85816	215	67.8	63.9
3/23/11 5:41	3	9.8424	227	63.8	60.9
3/23/11 5:51	3.7	12.13896	224	65.7	61.1
3/23/11 6:01	3.3	10.82664	229	65.4	61
3/23/11 6:11	2.9	9.51432	250	66.4	60.6
3/23/11 6:21	2.4	7.87392	230	70.7	68
3/23/11 6:31	2.4	7.87392	231	61.9	59.3
3/23/11 6:41	1.5	4.9212	248	67.9	61.6
3/23/11 6:51	1.5	4.9212	297	70.1	68.1
3/23/11 7:01	1.2	3.93696	232	63.3	60.6
3/23/11 7:11	1	3.2808	234	62	60

3/23/11 7:21	1.1	3.60888	233	64.2	61.7
3/23/11 7:31	0.7	2.29656	219	62.5	59.7
3/23/11 7:41	1.6	5.24928	215	62.3	58.9
3/23/11 7:51	1.3	4.26504	212	62	58.9
3/23/11 8:01	1.4	4.59312	215	62	58.9
3/23/11 8:11	1.7	5.57736	216	69.7	64.5
3/23/11 8:21	2.3	7.54584	154	62.6	59.2
3/23/11 8:31	1.4	4.59312	168	63.4	59.8
3/23/11 8:41	1.2	3.93696	207	62.2	59.4
3/23/11 8:51	2.4	7.87392	123	63.9	59.3

Attachment 4

Vestas 3.0 MW Wind Turbine Specification

Class 1
Item no. 950010.R1
2004-03-02

General Specification

V90 – 3.0 MW

60 Hz
Variable Speed Turbine



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1. General Description

The VESTAS V90 – 3.0 MW is a pitch regulated upwind wind turbine with active yaw and a three-blade rotor.

The VESTAS V90 – 3.0 MW has a rotor diameter of 90 m with a generator rated at 3.0 MW.

The turbine utilises the OptiTip[®] and the variable speed concepts. With these features rated power will be maintained even in high wind speeds, regardless of air temperature and air density, and the wind turbine is able to operate the rotor at variable speed (RPM). At low wind speeds the OptiTip[®] system and variable speed operation maximise the power output by giving the optimal RPM and pitch angle, which also minimises the sound emission from the turbine.

1.1 Nacelle Description

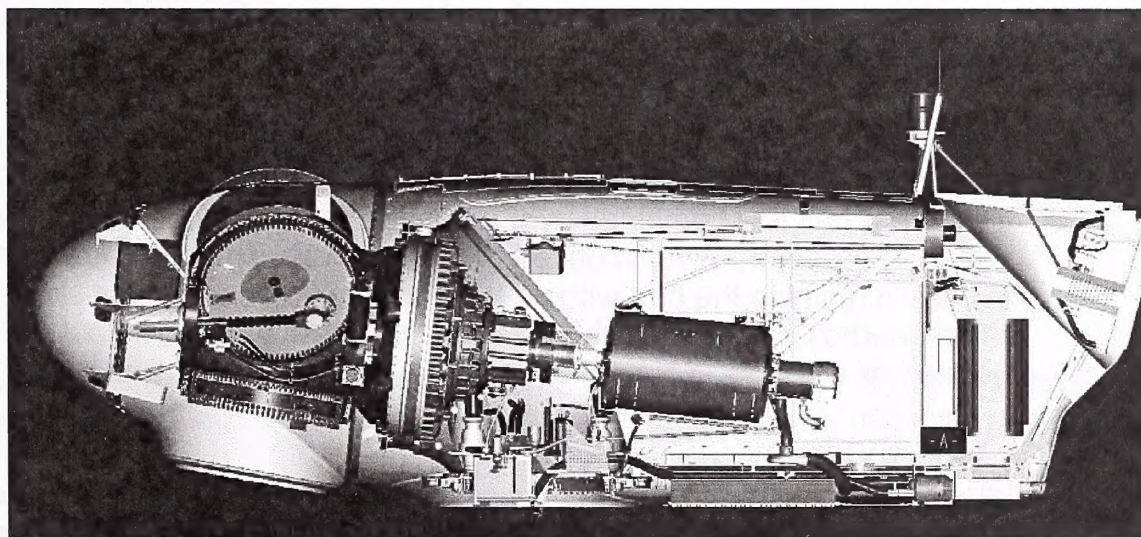


Fig. 1 V90 3.0 MW Nacelle

The nacelle cover is made of fibreglass. An opening in the floor provides access to the nacelle from the tower.

The roof section is equipped with skylights, which can be opened to access the roof and the wind sensors.

Wind sensors are mounted on the nacelle roof. Aviation lights, if any, are also placed on top of the nacelle.

1.1.1 Machine Foundation (the Bedplate)

The front of the nacelle bedplate is the foundation for the drive train, that transmits forces and torque from the rotor to the tower, through the yaw system. The front of the nacelle bedplate is made of cast steel. The nacelle cover is mounted on the nacelle bedplate.

The nacelle bedplate is in two parts and consists of a cast iron part and a girder structure.

The cast iron part serves as the foundation of the main gear and the generator. The bottom surface is machined and connected to the yaw bearing. The crane beams are attached to the top structure. The lower beams of the girder structure are connected at the rear end. The rear part of the bedplate serves as the foundation for controller panels, cooling system and transformer.

The four yaw-gears are bolted to nacelle bedplate.

The nacelle houses the internal 800 kg SWL service crane. The crane is a single system chain hoist. If any heavier parts need service, the service crane can be upgraded to 1600/10000 kg SWL.

The upgraded crane is able to lift and lower large elements such as parts of the gearbox and the generator.

1.1.2 Gearbox

The main gear transmits the torque from the rotor to the generator.

The gear unit is a combination of a 2-stage planetary gear and a 1-stage helical gear. The gear housing is bolted to the bedplate. The low speed input shaft is bolted directly to the hub without the use of a traditional main shaft.

The gearbox lubrication system is a forced feed system without the use of an integrated oil sump.

1.1.3 Yaw System

The yaw bearing system is a plain bearing system with built-in friction. The system enables the nacelle to rotate on top of the tower. The system transmits the forces from the turbine-rotor/nacelle to the tower.

Four electrical yaw gears with motor brakes rotate the nacelle.

1.1.4 The Brake System

The turbine brakes by full-feathering of the rotor blades. The individual pitch cylinders ensure triple braking safety.

Furthermore, a hydraulic system supplies pressure to a disc brake located on the main gear high-speed shaft. The disc brake system consists of 3 hydraulic brake callipers.

The disc brake is considered as the parking brake.

1.1.5 Generator

The generator is an asynchronous 4-pole generator with a wound rotor.

Variable speed allows varying the rotor speed within a wide speed range. This reduces power fluctuations in the power grid system as well as minimises the loads on vital parts of the turbine. Furthermore, the variable speed system optimises the power production, especially at low wind speeds. Variable speed technology enables control of the turbine reactive power factor between 0.96 inductive and 0.98 capacitive measured on the low voltage side.

The generator is water-cooled.

1.1.6 Transformer

The step up transformer is located in a separate compartment to the rear of the nacelle. The transformer is a three phase dry-type cast resin transformer specially designed for wind turbine applications.

The windings are delta connected on the medium voltage-side unless otherwise specified. The windings are connected in star on the low voltage-side (1000 V and 400 V). The 1000 V and 400 V systems in the nacelle are a TN-system, where the star point is connected to ground.

Surge arresters are mounted on the medium voltage (primary) side of the transformer.

The output voltages available are in 0.5 kV steps from 10 to 34.5 kV where 36kV(U_m) is the highest equipment peak voltage.

The transformer room is equipped with arc detection sensors.

1.1.7 The Cooling and Air-conditioning System

If the inside air temperature of the nacelle exceeds a certain level, flap valves will open to the outside. A fan engine will draw in outside air for cooling the nacelle air.

Gear lubrication oil, generator cooling water and the variable speed unit are cooled from a separate air intake, using separate water/air cooling systems. Water coolers are thermally insulated from other parts of the nacelle.

A separate fan cools the transformer.

The heat exchanger system is mounted in a separate compartment in the upper rear section of the nacelle.

1.2 Rotor V90

1.2.1 Hub / Nose Cone

The hub is mounted directly onto the gearbox, thereby eliminating the main shaft traditionally used to transmit the wind power to the generator through the gearbox.

1.2.2 Pitch Regulation

The V90 is equipped with a microprocessor controlled pitch control system called OptiTip®. Based on the prevailing wind conditions, the blades are continuously positioned to the optimum pitch angle.

The pitch mechanism is placed in the hub. Changes of the blade pitch angle are made by hydraulic cylinders, which are able to rotate the blade 95°. Every single blade has its own hydraulic pitch cylinder.

1.2.3 Hydraulics

A hydraulic system produces hydraulic pressure for the pitch systems in the hub. In case of grid failure or leakage, a backup accumulator system provides sufficient pressure to pitch the blades and stop the turbine.

A collector system prevents oil leaks, if any, from spreading outside the hub.

1.2.4 Blades

The blades are made of fibre glass reinforced epoxy and carbon fibres. Each blade consists of an inner beam encircled by two shells. The blades are designed for optimised output and minimised noise and light reflection. The V90 blade design minimizes the mechanical loads applied to the turbine.

The blade bearing is a double raced 4-point ball bearing bolted to the blade hub. Each blade has a lightning protection system consisting of lightning receptors on the blade tip and a copper wire conductor inside the blade.

1.3 Control and Regulation

1.3.1 Variable Speed Description

Variable speed ensures a steady and stable electric power production from the turbine.

The variable speed system consists of an asynchronous generator with wound rotor, slip rings and power converter. A power converter is connected to the rotor to control the generator at variable speed. In supersynchronous operation due to wind gusts, the excess rotor energy is dissipated in a chopper resistor.

The variable speed and the OptiTip system ensure energy optimisation, low noise operation and reduction of loads on all vital components.

The system controls the current in the rotor circuit of the generator. This gives precise control of the reactive power, and gives a smooth connection sequence when the generator is connected to the grid.

The reactive power control is as default set at 0 KVAR export/ import at 1000 V.

1.3.2 Vestas Multi Processor Controller

All functions of the wind turbine are monitored and controlled by microprocessor based control units called VMP (Vestas Multi Processor).

The VMP controller consists of several individual sub controller systems. Each system has separate operation tasks and communicate via an optical-based network (ArcNet).

The controller enclosures are located in the bottom of the tower, in the nacelle and in the hub.

The operating system is VxWorks[®], which fulfils the demands for stability, flexibility and security that are expected in a modern, intelligent wind turbine.

Digital and analogue Input/Output functions in the turbine are interfaced via the use of distributed units communicating on the CAN-open protocol.

The VMP-controller is equipped with a battery backup system.

The VMP controller serves the following functions:

- Monitoring and supervision of the operation.
- Synchronising the generator to the grid during the connection sequence, in order to limit the in rush current.
- Operating of the turbine during various fault situations.
- Automatic yawing of the nacelle in accordance to the wind direction.
- OptiTip[®] -Controlling the blade pitch.
- Reactive power control and variable speed.
- Noise emission control.
- Monitoring of ambient conditions (wind, temperature, etc).
- Monitoring of the grid.

- Monitoring and logging of lightning strikes.
- Supervising of the smoke detection system.
- De-rating in case of critical high temperatures.

1.3.2.1 Active Damping of Tower Oscillations

In the nacelle two accelerometers are mounted for monitoring longitudinal and transverse oscillations. Such oscillations can in certain situations be introduced when the rotational frequency of the rotor is close to the natural inherent frequency (natural oscillation) of the tower, but also high wind speeds in combination with high turbulence may cause tower oscillations.

If the oscillations exceed a certain limit, the system will bring the turbine back to normal operating conditions.

To avoid stopping the turbine, tower oscillations are damped by changing the rotational frequency of the rotor and by pitching the blades.

To damp longitudinal oscillations the blades are pitched synchronously. Transverse oscillations are damped by individual pitch.

The turbine is only stopped if the active damping is not successful.

1.3.2.2 Active Damping of Drive Train Torsional Oscillations on Variable Speed Controlled Turbines

Oscillations that may occur on the drive train can be monitored by measuring the number of revolutions and can be damped via an active control of the generator.

If the oscillations exceed a certain limit, the system is activated in order to stop further escalation of the drive train oscillations.

1.4 Monitoring

1.4.1 Sensors

Data for controlling the turbine and the energy production is received from different sensors:

- Weather conditions: Wind direction, wind speed and temperature.
- Machine conditions: Temperatures, oil level and pressure, cooling water level, vibrations.
- Rotor activity: Speed and pitch position.
- Construction: Vibrations, lightning detectors.
- Grid connection: Active power, reactive power, voltage, current, frequency, $\cos\phi$.

1.4.2 Sensor Features

1.4.2.1 Ultrasonic Wind Sensors

The nacelle is equipped with two redundant ultrasonic wind sensors in order to increase the reliability and accuracy of the wind measurements. The wind sensors measure the wind direction and wind speed.

The sensor is self-testing, and if the sensor signal is defective, the turbine will be brought to a safe condition.

To improve performance during icy conditions the sensors are equipped with a heating element.

The sensors are located on top of the nacelle and are protected against lightning strikes.

1.4.2.2 Smoke Detectors

The tower and nacelle are equipped with optical smoke sensors. If smoke is detected an alarm is sent via the RCS (Remote Control System) and the main switcher is activated. The detectors are self-controlling. If a detector becomes defective, a warning is sent via the RCS.

1.4.2.3 Lightning Detectors

Lightning detectors are located in each rotor blade.

1.4.2.4 Accelerometers

Accelerometers register the movements of the tower top. The registrations are intelligent-controlled by the VMP and used to remove unfavourable movements and vibrations.

1.4.2.5 GPS (Real Time Clock)

The GPS is primarily used to synchronise the turbine clock. The GPS accuracy is within 1 second. Via this system it is possible to compare the various log observations with other turbines within the same area/site. E.g. fluctuations in the power, grid or lightning activity.

1.4.2.6 Arc Protection

The transformer and the low voltage switchboards are protected by an arc protection system. In case of an electrical arc, the system will instantly open the main breaker downstream from the turbine.

1.5 Lightning Protection

The V90 Wind Turbine is equipped with Vestas Lightning Protection, which protects the entire turbine from the tip of the blades to the foundation. The system enables the lightning current to by-pass all vital components within the blade, nacelle and tower without causing damage. As an extra safety precaution, the control units and processors in the nacelle are protected by an efficient shielding system.

The lightning protection is designed according to IEC 61024 – “Lightning Protection of Wind Turbine Generators”.

Lightning detectors are mounted on all three rotor blades. Data from the detectors are logged and enable the operator to identify which one of the blades that were hit, the exact time of the stroke, and how powerful the lightning was.

These data are very useful for making a remote estimate of possible damage to the turbine and the need for inspection.

1.6 Service

Service interval: 12 months

1.6.1 Lubrication of Components

- Blade bearings: Automatic lubrication from an electrically driven unit. Re-fill every 12 months.
- Generator bearings: Automatically lubricated via the gear oil system.
- Gearbox: The oil is collected in a tank. From the collection tank the oil is pumped to a heat exchanger and back to the gearbox. The pumps distribute the oil to the gear wheels and bearings.
- Yaw gear: lubrication in sealed oil bath, which is inspected every 12 months.
- Hydraulic system: The oil level is inspected every 12 months.

2. Main Data

2.1 Power Curve, Calculated

Calculated at 1000V / 400V, low voltage side of the medium voltage transformer.

2.1.1 Power Curve, 109.4 dB(A)

V90 – 3.0 MW, 60 Hz, 109.4 dB(A)												
Wind Speed [m/s]	Air Density [kg/m ³]											
	0.97	1	1.03	1.06	1.09	1.12	1.15	1.18	1.21	1.225	1.24	1.27
4	53	56	59	61	64	67	70	72	75	77	78	81
5	142	148	153	159	165	170	176	181	187	190	193	198
6	271	281	290	300	310	319	329	339	348	353	358	368
7	451	466	482	497	512	528	543	558	574	581	589	604
8	691	714	737	760	783	806	829	852	875	886	898	921
9	995	1028	1061	1093	1126	1159	1191	1224	1257	1273	1289	1322
10	1341	1385	1428	1471	1515	1558	1602	1645	1688	1710	1732	1775
11	1686	1740	1794	1849	1903	1956	2010	2064	2118	2145	2172	2226
12	2010	2074	2137	2201	2265	2329	2392	2454	2514	2544	2573	2628
13	2310	2382	2455	2525	2593	2658	2717	2771	2817	2837	2856	2889
14	2588	2662	2730	2790	2841	2883	2915	2940	2958	2965	2971	2981
15	2815	2868	2909	2939	2960	2975	2984	2990	2994	2995	2996	2998
16	2943	2965	2979	2988	2993	2996	2998	2999	2999	3000	3000	3000
17	2988	2994	2997	2998	2999	3000	3000	3000	3000	3000	3000	3000
18	2998	2999	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
19	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
20	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
21	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
22	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
23	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
24	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
25	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Wind speed as 10 minutes average value at hub height and perpendicular to the rotor plane

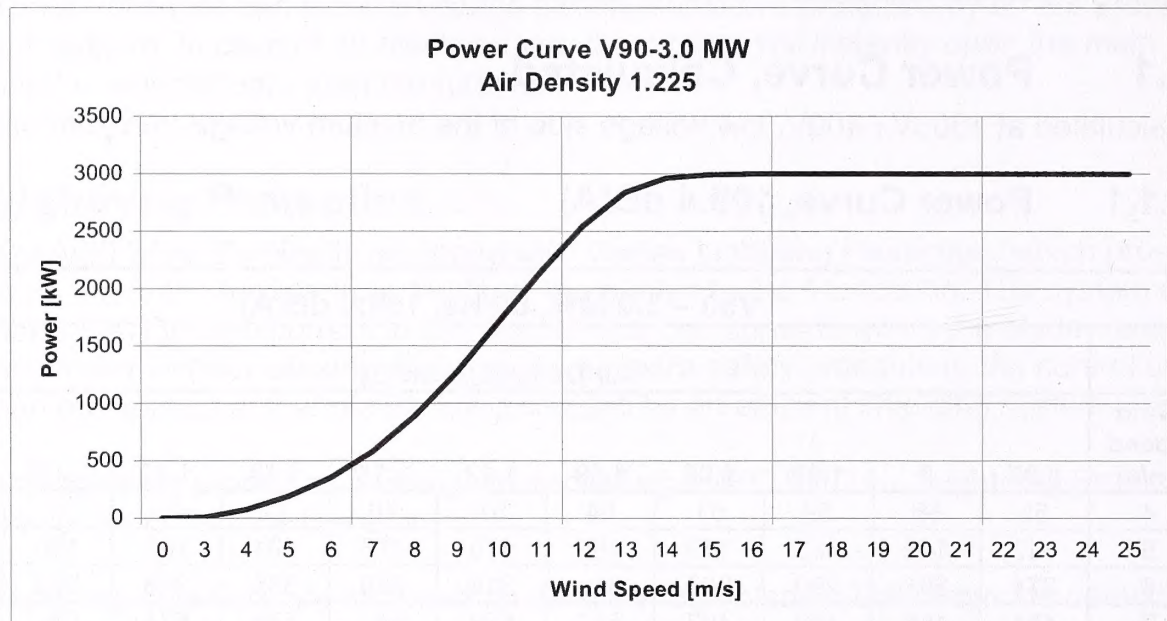


Fig. 2 Power curve for VESTAS V90 – 3.0 MW, 60 Hz 109.4 dB(A)

2.1.2 Power Curve, 107.8 dB(A)

V90 – 3.0 MW, 60 Hz, 107.8 dB(A)												
Wind Speed [m/s]	Air Density [kg/m ³]											
	0.97	1	1.03	1.06	1.09	1.12	1.15	1.18	1.21	1.225	1.24	1.27
4	53	56	59	61	64	67	70	72	75	77	78	81
5	142	148	153	159	165	170	176	181	187	190	193	198
6	271	281	290	300	310	319	329	339	348	353	358	368
7	451	466	482	497	512	528	543	558	574	581	589	604
8	691	714	737	760	783	806	829	852	875	886	898	921
9	994	1027	1060	1092	1125	1157	1190	1223	1255	1272	1288	1321
10	1330	1373	1416	1460	1503	1546	1589	1632	1675	1696	1718	1761
11	1656	1709	1762	1815	1868	1921	1974	2027	2080	2106	2133	2186
12	1963	2026	2088	2151	2213	2276	2338	2399	2459	2489	2518	2575
13	2258	2329	2400	2470	2539	2605	2666	2723	2774	2797	2818	2856
14	2539	2614	2684	2748	2804	2851	2889	2919	2942	2951	2959	2971
15	2778	2837	2883	2919	2946	2964	2977	2985	2991	2993	2994	2996
16	2925	2953	2971	2983	2990	2994	2997	2998	2999	2999	2999	3000
17	2983	2991	2995	2997	2999	2999	3000	3000	3000	3000	3000	3000
18	2997	2999	2999	3000	3000	3000	3000	3000	3000	3000	3000	3000
19	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
20	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
21	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
22	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
23	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
24	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
25	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Wind speed as 10 minutes average value at hub height and perpendicular to the rotor plane

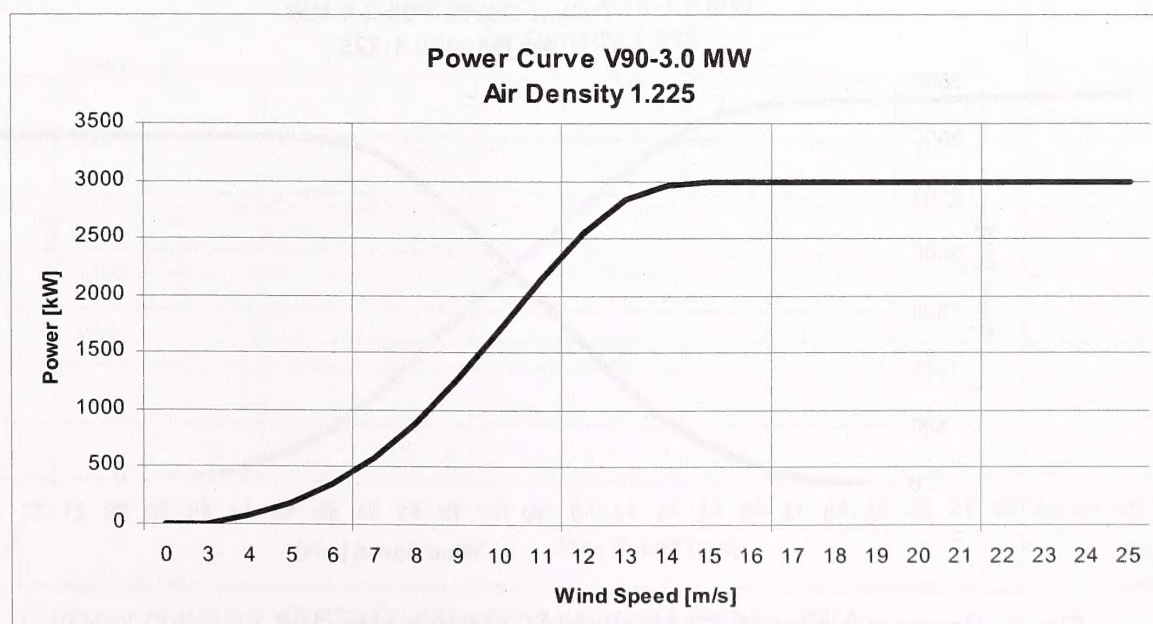


Fig. 3 Power curve for VESTAS V90 – 3.0 MW, 60 Hz, 107.8 dB(A)

2.1.3 Power Curve, 106.7 dB(A)

V90 – 3.0 MW, 60 Hz, 106.7 dB(A)												
Wind Speed [m/s]	Air Density [kg/m ³]											
	0.97	1	1.03	1.06	1.09	1.12	1.15	1.18	1.21	1.225	1.24	1.27
4	53	56	59	61	64	67	70	72	75	77	78	81
5	142	148	153	159	165	170	176	181	187	190	193	198
6	271	281	290	300	310	319	329	339	348	353	358	368
7	451	466	482	497	512	528	543	558	574	581	589	604
8	691	713	736	759	782	805	828	851	874	885	897	920
9	984	1016	1048	1080	1113	1145	1177	1209	1242	1258	1274	1306
10	1286	1328	1370	1412	1453	1495	1537	1578	1620	1641	1662	1703
11	1575	1625	1676	1726	1777	1827	1878	1928	1979	2004	2029	2080
12	1852	1911	1970	2029	2088	2147	2206	2265	2324	2353	2382	2439
13	2119	2186	2253	2320	2387	2453	2518	2581	2642	2671	2699	2749
14	2376	2451	2524	2595	2662	2724	2781	2829	2871	2888	2904	2928
15	2624	2697	2763	2820	2867	2905	2934	2955	2970	2976	2981	2987
16	2828	2879	2917	2946	2965	2978	2987	2992	2995	2997	2997	2998
17	2944	2966	2980	2989	2994	2996	2998	2999	2999	3000	3000	3000
18	2987	2993	2996	2998	2999	3000	3000	3000	3000	3000	3000	3000
19	2998	2999	2999	3000	3000	3000	3000	3000	3000	3000	3000	3000
20	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
21	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
22	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
23	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
24	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
25	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Wind speed as 10 minutes average value at hub height and perpendicular to the rotor plane

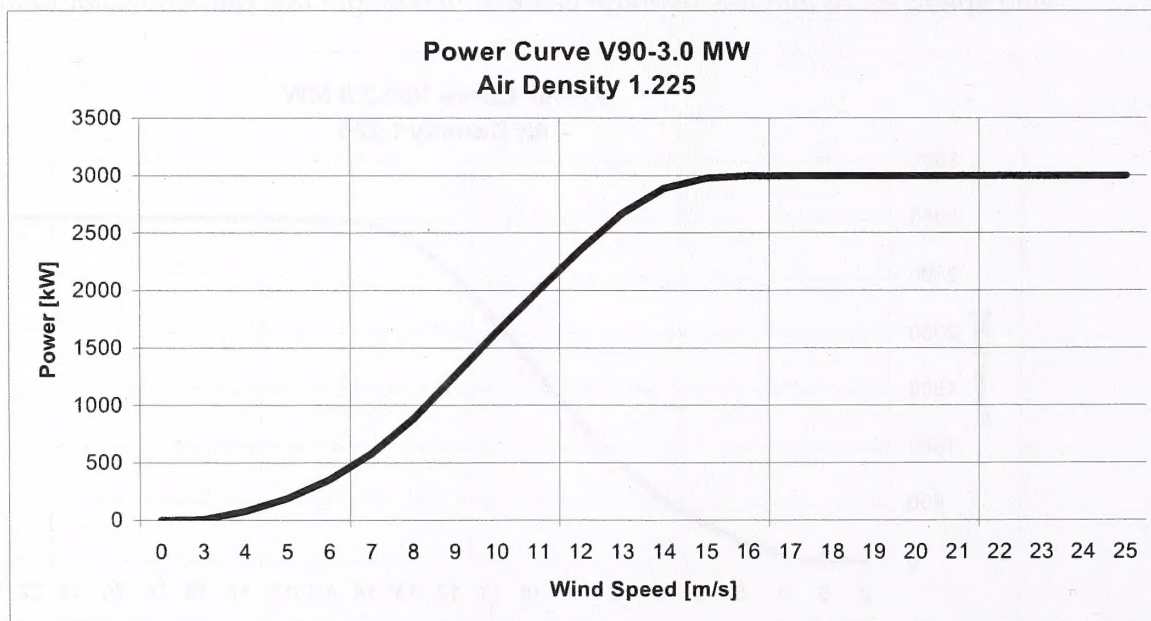


Fig. 4 Power curve for VESTAS V90 – 3.0 MW, 60 Hz, 106.7

2.1.4 Power Curve, 104.2 dB(A)

V90 – 3.0 MW, 60 Hz, 104.2 dB(A)												
Air Density [kg/m ³]												
Wind Speed [m/s]	0.97	1	1.03	1.06	1.09	1.12	1.15	1.18	1.21	1.225	1.24	1.27
4	53	56	59	61	64	67	70	72	75	77	78	81
5	142	148	153	159	165	170	176	181	187	190	193	198
6	271	281	290	300	310	319	329	339	348	353	358	368
7	451	466	481	497	512	527	543	558	573	581	588	604
8	679	702	724	747	769	792	814	837	859	871	882	904
9	917	947	978	1008	1038	1068	1098	1128	1158	1173	1188	1218
10	1145	1182	1219	1256	1293	1330	1368	1405	1442	1460	1479	1516
11	1364	1408	1451	1495	1539	1583	1627	1670	1714	1736	1758	1802
12	1577	1627	1677	1728	1778	1828	1879	1929	1979	2004	2029	2080
13	1782	1839	1895	1952	2009	2065	2122	2179	2235	2263	2291	2344
14	1965	2027	2089	2152	2214	2276	2338	2400	2462	2492	2517	2556
15	2094	2160	2226	2293	2359	2425	2491	2557	2623	2653	2666	2682
16	2161	2229	2297	2366	2434	2502	2570	2638	2706	2735	2740	2744
17	2188	2257	2326	2395	2465	2534	2602	2671	2740	2771	2772	2772
18	2199	2268	2338	2407	2477	2546	2615	2685	2754	2786	2786	2786
19	2205	2274	2344	2414	2483	2553	2622	2692	2761	2794	2794	2794
20	2210	2280	2350	2420	2489	2559	2629	2698	2768	2800	2801	2801
21	2216	2286	2356	2426	2496	2566	2636	2706	2776	2808	2808	2808
22	2224	2294	2364	2434	2505	2575	2645	2715	2785	2817	2818	2818
23	2232	2302	2373	2443	2514	2584	2655	2725	2795	2829	2829	2829
24	2240	2311	2382	2452	2523	2594	2664	2735	2805	2840	2840	2840
25	2246	2318	2389	2459	2530	2601	2672	2743	2814	2848	2849	2849

Wind speed as 10 minutes average value at hub height and perpendicular to the rotor plane

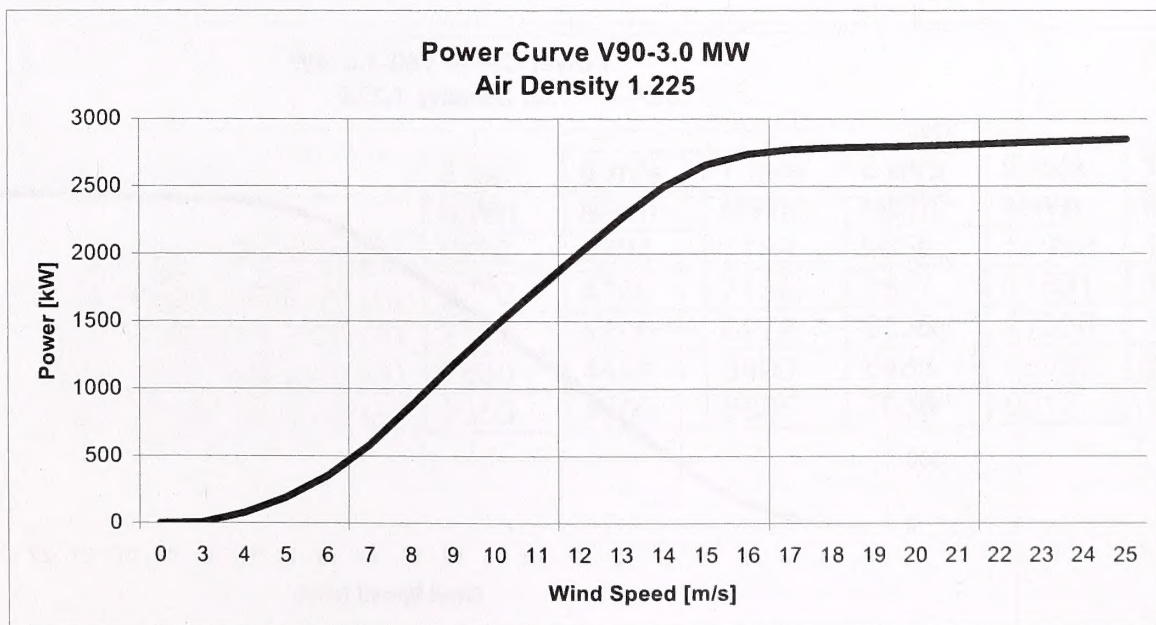


Fig. 5 Power curve for VESTAS V90 – 3.0 MW, 60 Hz, 104.2 dB(A)

2.1.5 Power Curve, 102.0 dB(A)

V90 – 3.0 MW, 60 Hz, 102.0 dB(A)												
Wind Speed [m/s]	Air Density [kg/m ³]											
	0.97	1	1.03	1.06	1.09	1.12	1.15	1.18	1.21	1.225	1.24	1.27
4	53	56	59	61	64	67	70	72	75	77	78	81
5	142	148	153	159	165	170	176	181	187	190	193	198
6	271	281	290	300	310	319	329	339	348	353	358	367
7	447	463	478	493	508	523	538	553	569	576	584	599
8	642	663	684	705	726	748	769	790	811	822	833	854
9	826	853	880	907	934	961	989	1016	1043	1056	1070	1097
10	1004	1037	1069	1102	1135	1167	1200	1233	1265	1282	1298	1331
11	1177	1215	1253	1291	1329	1367	1405	1443	1481	1500	1519	1557
12	1346	1389	1433	1476	1519	1562	1605	1648	1691	1713	1734	1777
13	1511	1559	1607	1656	1704	1752	1800	1848	1896	1920	1944	1992
14	1669	1723	1776	1829	1882	1935	1988	2041	2093	2120	2145	2190
15	1806	1863	1920	1977	2035	2092	2149	2206	2263	2291	2311	2340
16	1897	1957	2017	2077	2137	2196	2256	2316	2376	2404	2414	2425
17	1941	2002	2064	2125	2186	2248	2309	2370	2431	2459	2463	2465
18	1958	2020	2082	2144	2206	2268	2329	2391	2453	2481	2482	2483
19	1965	2027	2089	2151	2213	2275	2337	2399	2461	2490	2490	2490
20	1968	2031	2093	2155	2217	2279	2341	2403	2465	2495	2495	2495
21	1972	2035	2097	2160	2222	2284	2346	2408	2471	2500	2500	2500
22	1978	2040	2103	2166	2228	2290	2353	2415	2477	2507	2507	2507
23	1985	2047	2110	2173	2236	2298	2361	2423	2486	2516	2516	2516
24	1991	2054	2117	2180	2243	2306	2369	2431	2494	2525	2525	2525
25	1997	2060	2123	2186	2249	2312	2375	2438	2501	2532	2532	2532

Wind speed as 10 minutes average value at hub height and perpendicular to the rotor plane

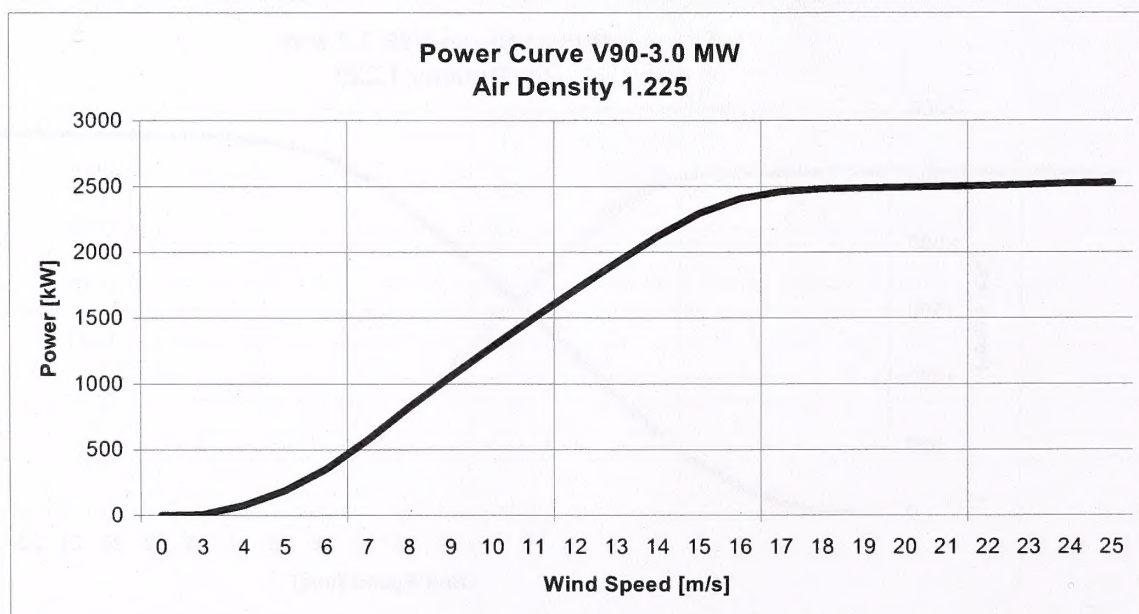


Fig. 6 Power curve for VESTAS V90 - 3.0 MW, 60 Hz, 102.0 dB(A)

2.2 Annual Production V90-3.0MW

Below the annual outputs for different wind distributions are listed. All calculations are based on wind conditions with 10 % turbulence and an air density of 1.225 kg/m³.

C=1.5						
Wind Turbine	5 m/s MWh	6 m/s MWh	7 m/s MWh	8 m/s MWh	9 m/s MWh	10 m/s MWh
V90 3 MW 109.4 dB (A)	4004	5889	7701	9305	10631	11664
V90 3 MW 107.8 dB (A)	3979	5849	7650	9245	10567	11598
V90 3 MW 106.7 dB (A)	3900	5725	7491	9063	10371	11395
V90 3 MW 104.2 dB (A)	3604	5231	6809	8222	9406	10340
V90 3 MW 102.0 dB (A)	3290	4710	6083	7312	8342	9156

C=2.0						
Wind Turbine	5 m/s MWh	6 m/s MWh	7 m/s MWh	8 m/s MWh	9 m/s MWh	10 m/s MWh
V90 3 MW 109.4 dB (A)	3114	5344	7559	9710	11654	13301
V90 3 MW 107.8 dB (A)	3101	5309	7502	9637	11571	13213
V90 3 MW 106.7 dB (A)	3057	5197	7326	9413	11317	12946
V90 3 MW 104.2 dB (A)	2903	4804	6672	8511	10208	11679
V90 3 MW 102.0 dB (A)	2724	4387	5997	7577	9041	10316

C=2.5						
Wind Turbine	5 m/s MWh	6 m/s MWh	7 m/s MWh	8 m/s MWh	9 m/s MWh	10 m/s MWh
V90 3 MW 109.4 dB (A)	2776	4804	7189	9658	11990	14061
V90 3 MW 107.8 dB (A)	2770	4780	7136	9577	11891	13953
V90 3 MW 106.7 dB (A)	2750	4700	6970	9330	11590	13626
V90 3 MW 104.2 dB (A)	2668	4424	6400	8438	10409	12218
V90 3 MW 102.0 dB (A)	2553	4109	5805	7536	9212	10765

2.3 Noise curves V90-3.0 MW

2.3.1 Noise Curve V90 – 3.0 MW, 60 Hz, 109.4 dB (A)

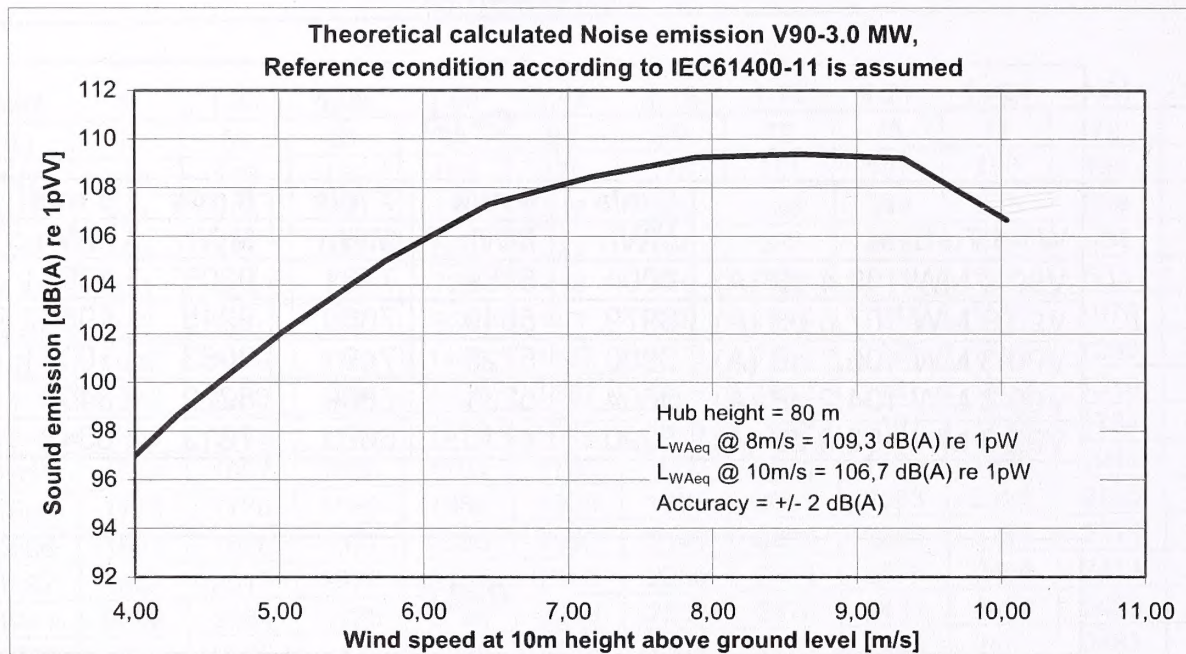


Fig. 7 Noise Emission V90 – 3.0 MW, 60 Hz: 109.4 dB (A) measures at 9 m/s in 10 m height

2.3.2 Noise Curve V90 – 3.0 MW, 60 Hz, 107.8 dB (A)

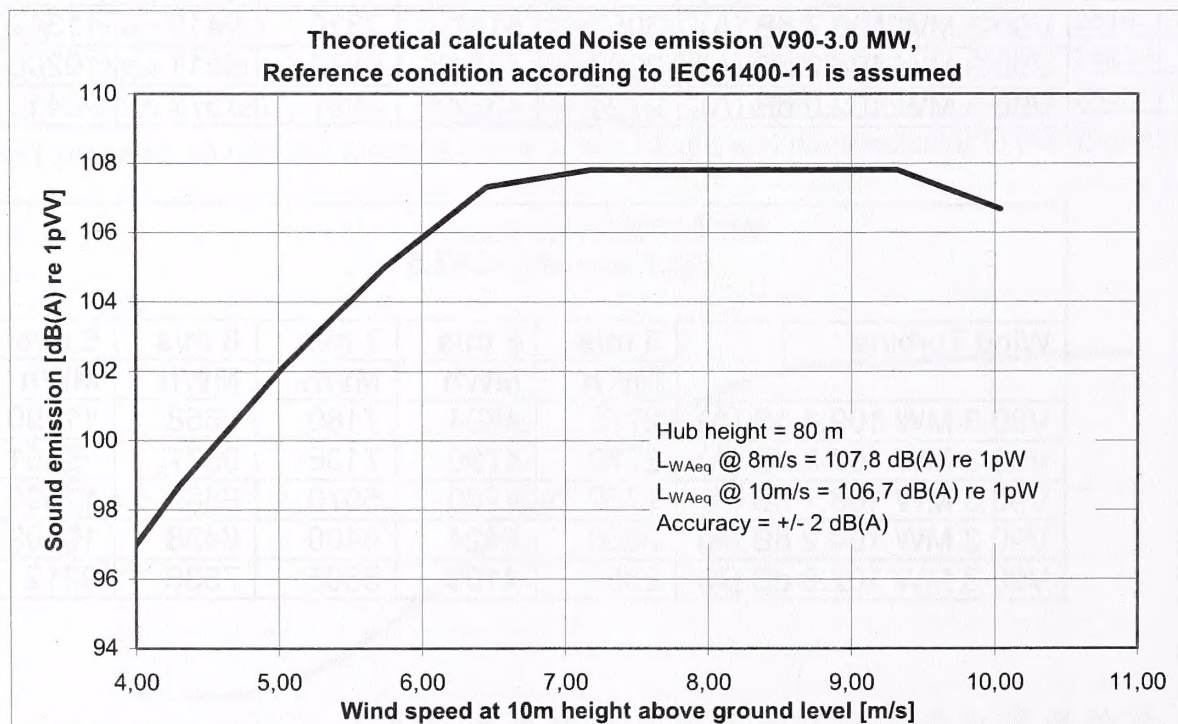


Fig. 8 Noise Emission V90 – 3.0 MW, 60 Hz: 107.8 dB (A) measures at 8 m/s in 10 m height

2.3.3 Noise Curve V90 – 3.0 MW, 60 Hz, 106.7 dB (A)

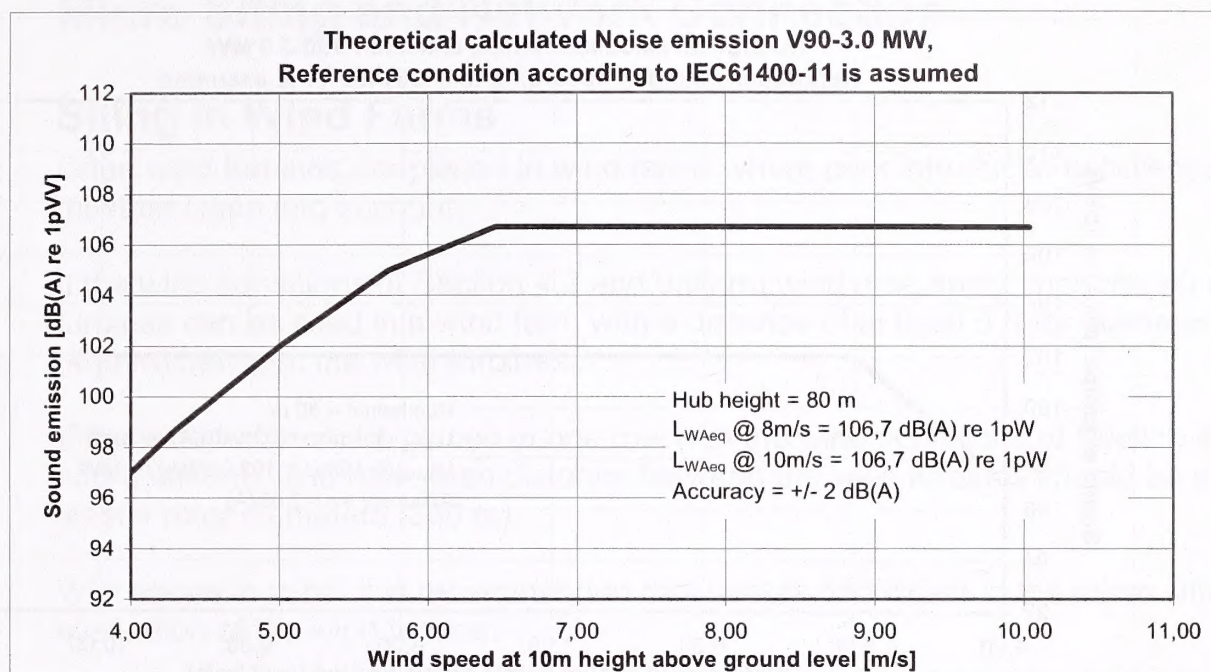


Fig. 9 Noise Emission V90 – 3.0 MW, 60 Hz: 106.7 dB (A) measures at 8 m/s in 10 m height

2.3.4 Noise Curve V90 – 3.0 MW, 60 Hz, 104.2 dB (A)

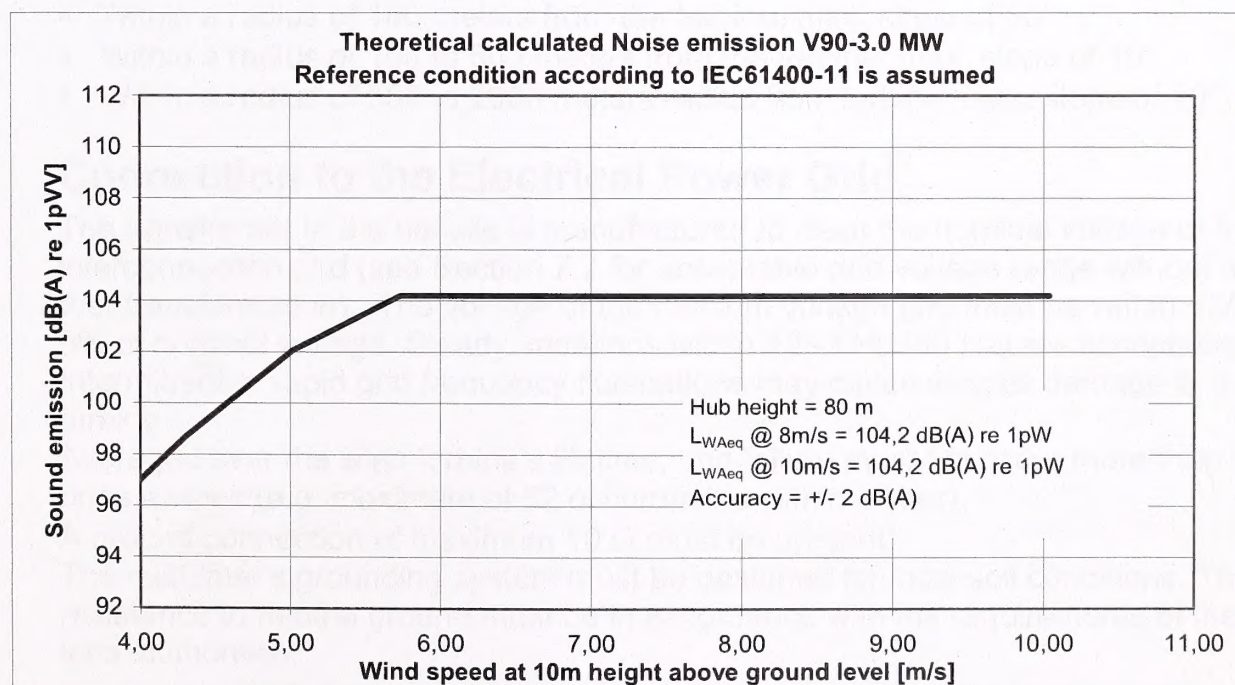


Fig. 10 Noise Emission V90 – 3.0 MW, 60 Hz: 104.2 dB (A) measures at 8 m/s in 10 m height

2.3.5 Noise Curve V90 – 3.0 MW, 60 Hz, 102.0 dB (A)

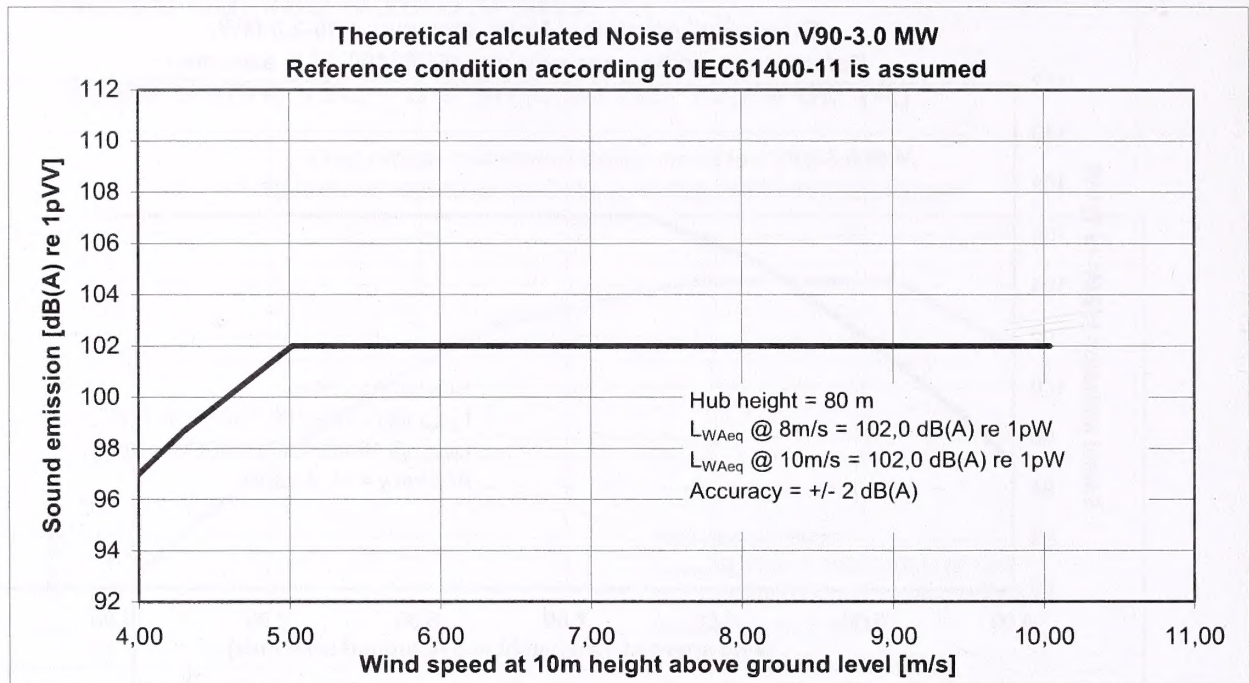


Fig. 11 Noise Emission V90 – 3.0 MW, 60 Hz: 102.0 dB (A) measures at 8 m/s in 10 m height

3. Micro Siting and Network Connection

3.1 Siting in Wind Farms

Often wind turbines are placed in wind farms where park introduced turbulence must be taken into account.

If the wind conditions of Section 4.2 and uniform wind rose apply, then the wind turbines can be sited in a wind farm with a distance of at least 5 rotor diameters (450 m) between the wind turbines.

If the wind turbines are placed in one row with the wind conditions of Section 4.2 and a uniform wind rose, then distance between the wind turbines should be at least 4 rotor diameters (360 m).

With above in mind, it is recommended that Vestas participate in the micro siting evaluation of the wind turbine.

3.2 Terrain Conditions

If the terrain is outside the below listed rules or the terrain otherwise seems complex, particular considerations may be necessary and Vestas must be contacted.

- Within a radius of 100 meters from the turbine, max. slope of 10°
- Within a radius of 100 to 500 meters from the turbine, max. slope of 15°
- Within a radius of 500 to 2000 meters radius from turbine, max. slope of 20°

3.3 Connection to the Electrical Power Grid

The transformer in the nacelle is manufactured to meet the nominal voltage of the interconnection grid (see Section 7.7 for acceptable grid voltage range without further transformation). The voltage of the medium voltage grid must be within +5/-5% of nominal voltage. Steady variations within +2/-3 Hz (60 Hz) are acceptable. Intermittent or rapid grid frequency fluctuations may cause serious damage to the turbine.

Averaged over the wind turbine's lifetime, grid failure must not occur more than once a week (e.g. maximum of 52 occurrences within a year).

A ground connection of maximum 10 Ω must be present.

The customer's grounding system must be designed for local soil conditions. The resistance to neutral ground must be in accordance with the requirements of the local authorities.

NB: When ordering, please provide VESTAS with precise information about grid voltage in order to facilitate specification of the transformer's nominal voltage and winding connection (delta connection on the medium voltage winding is supplied as default, unless otherwise specified). As an option, VESTAS offers medium voltage switchgear.

4. General Ambient Design Criteria

4.1 General Conditions

The wind turbine is designed for operation in ambient temperatures ranging from -20°C to +40°C. All components including liquids, oil etc. are designed to survive temperatures as low as -40°C. Special precautions must be taken outside these temperatures. If the temperature inside the nacelle exceeds 50°C, the turbine is paused.

The relative humidity can be 100 % (max. 10 % of the lifetime). Corrosion protection according to ISO 12944-2 or corrosion class C5M (outside) and C3 to C4 (inside). All corrosion protections are designed for long lifetime (more than 15 years). See special differentiation on tower in section 7.17 Tower.

4.2 Wind Conditions

The wind conditions can be described by a Weibull distribution where the annual average wind speed and a shape parameter describe the wind distribution. Further the wind climate can be described by maximum wind speeds and the turbulence. Turbulence is a factor to describe short-term wind variations/fluctuations. Below is listed the design conditions assumed for the operating environment for the Vestas V90-3.0 MW, 60 Hz wind turbine.

• Standard	IEC IIA
• Average wind speed	8.5 m/s
• C-parameter	2
• Turbulence I_{15}^*)	18%
• Max average wind $^{**})$	42.5 m/s
• Max wind gust $^{***})$	59.5 m/s

$^*)$ The turbulence is wind dependent and varies from 34.1 – 16.1% at wind speeds between 4 - 25 m/s. At 15 m/s the turbulence is 18%

$^{**})$ 10 min., 50 years' mean wind speed

$^{***})$ 3 sec., 50 years' gust wind speed

Wind speed and turbulence refer to hub height.

The above listed wind conditions are design parameters as is the cut out wind speed. Other parameters can also influence the turbine lifetime and the following values should not be exceeded.

• Max wind gust acceleration	10 m/s ²
• Cut out Wind Speed	25 m/s
• Restart Wind Speed	20 m/s

5. Type Approvals

The V90 – 3.0 MW wind turbine will be type approved in accordance with:

- IEC WT01
- DS472
- NVN 11400-0
- DIBt Richtlinie für Windkraftanlagen
- SITAC

6. Options

6.1 Power Quality

The turbine is optionally equipped with a three-phase voltage- and current-measuring module.

The instrument transformers are located on the medium-voltage side, which afford the possibility to compensate the reactive power consumption in transformer and connection cables.

Based on measurements the following will be calculated:

- RMS active power
- RMS reactive power
- Phase angle (Cos Phi)
- Frequency
- Asymmetric ampere/voltage

From these calculations statistics are made on the power quality.

6.2 Medium Voltage Switch Gear

The purpose of the switch gear is to protect the turbine against over current, short circuit and ground faults. The switchgear consists of a gas-tight tank containing SF6 gas, a load-interrupter switch and a resettable fault interrupter, with visible open gaps (where required), integral visible grounds and a microprocessor-based overcurrent control. The load-breaker is also a 3-positioned breaker, which can earth the transformer cable through the circuit breaker. Load-interrupter switch terminals are equipped with bushings rated 600 amperes continuous, and fault-interrupter terminals that are equipped with bushing wells rated 200 amperes continuous or bushings rated 600 amperes continuous (as specified) to provide for elbow connection. Manual operating mechanisms and viewing windows are located to protect operating personnel from the bushings and bushing wells while performing any routine operations. A motor-operator is available for remote tripping of the switchgear, by the VMP controller, arc detector, smoke detector or manually from the nacelle.

Loop in and - out option is available.

6.3 Remote Control and Monitoring – VestasOnline™

The VestasOnline™ product family is the new generation of remote monitoring and control solutions from Vestas. It is based on field experience from the proven Vestas Remote Panel for Windows (WRPWin) and Vestas Graphical Control and Supervision (VGCS) programs. VestasOnline™ consists of three separate product packages:

VestasOnline™ Standard - designed for control and monitoring of single wind turbines and smaller wind power plants, typically consisting of up to 20 wind turbines.

VestasOnline™ Professional - designed for wind power plants that require additional functionality and flexibility as it includes a professional SQL database with capacity to store several years of wind power plant data. In addition, VestasOnline™ Professional also integrates and controls other wind power plant equipment such as substations, grid measurement stations, meteorological equipment and PLC systems. VestasOnline™ Professional is the recommended solution for single wind power plants consisting of up to 250 wind turbines.

VestasOnline™ Enterprise - is the high-end member of the product family. It contains all the features of VestasOnline™ Professional plus additional advanced software options for monitoring and managing multiple wind power plants.

VestasOnline™ Enterprise is the recommended solution for wind power plants consisting of up to 2000 wind turbines as well as for wind power plants with the highest demand for system availability.

6.4 Obstruction Light

At customer's request, Vestas is capable of delivering optional obstruction lighting for the V90 turbine. The turbine will be equipped with 2 obstruction lights on the nacelle, placed in such a manner that at least one light will always be visible.

The following standard integrated aviation light options are available:

1. Low intensity. Red 10-200 cd.
2. Medium intensity. Red/white/dual 200-2000 cd.
3. Medium intensity. Red/white/dual 2000 - 20000 cd.

The options are designed according to the ICAO- and the FAA codes.

When using obstruction light delivered by Vestas, a range of additional features are offered: Remote monitoring of light function, supervision of remaining lifetime, alarm if a lamp failure occurs and intensity control according to weather visibility and UPS. When installed in a wind farm, the obstruction light flash can be synchronized throughout the whole wind farm.

6.5 Service lift inside the tower

The turbine can be delivered with a UL/CSA approved service lift inside the tower.

6.6 Wind turbine color

Ral 9010 (white) and Ral 7035 (light grey) is available.

7. Technical Specifications & Diagrams

7.1 Rotor

Diameter:	90 m
Swept area:	6362 m ²
Speed, nominal power:	16.1 RPM Speed, Dynamic operation range
rotor:	9.9 - 18.4 RPM
Rotational direction:	Clockwise (front view)
Orientation:	Upwind
Tilt:	6°
Blade coning:	4°
Number of blades:	3
Aerodynamic brakes:	Full feathering

7.2 Hub

Type:	SG Cast Iron
Material:	GJS-400-18U-LT
Weight:	8500 kg

7.3 Blades

Principle:	Airfoil shells bonded to supporting beam
Material:	Fibreglass reinforced epoxy and carbon fibres
Blade connection:	Steel root inserts
Air foils:	RISØ P + FFA-W3
Length:	44 m
Chord at blade root:	3.512 m
Chord at blade tip:	0.391 m
Twist (blade root/blade tip):	17.5°

7.4 Bearings

Type:	4-point ball bearing
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7.5 Sensors

7.5.1 Lightning Detector

Appellation:	Lightning detector
Signal:	Optical Analogue

7.5.2 Wind Sensor

Appellation:	Ultrasonic wind sensor, (2 units)
Signal:	RS485/optical

Accuracy: +/- 0.1 m/s, less than 5 m/s
+/- 2 %, more than 5 m/s

7.5.3 Smoke

Appellation: Smoke detector
Signal: Digital 24 V

7.5.4 Movements and Vibrations

Appellation: Accelerometer, tower
Signal: RS485

7.6 Generator

Generator 60 Hz
3.0 MW
Asynchronous with wound rotor,
slip rings and VCRS
1000 VAC
60 Hz
4
IP54
1758
1.0
0.98_{CAP} - 0.96_{IND}

Rated power:
Type:
Voltage:
Frequency:
No. of poles:
Class of protection:
Rated speed:
Rated power factor,
default at 1000 V:
Power factor range at
1000 V:

7.7 Transformer

Type: Cast resin
 Rated Power: 3160 kVA
 High voltage: 10 – 34.5 kV
 Frequency: 60 Hz
 Vector group: Dyn
 HV – Tappings: $\pm 2 \times 2.5\%$

Low voltage: 1000 V
 Power at 1000 V: 3326 kVA

Low voltage: 400 V
 Power at 400 V: 168 kVA

7.8 Switch Gear Electrical Characteristics

7.8.1 Feeder Function

Rated voltage [kV] (Max. system voltage)	27	38
Rated current [A]	600	600
Short time withstand current (1 or 3 s) [kA]	25	25
Insulation level:		
Power frequency (1 min) [kV]	50	50
Lightning impulse [kV _{peak}]	125	150
Making capacity [kA _{peak}]	40	40
Breaking capacity:		
Mainly active current [A]	600	600

7.8.2 Circuit Breaker Function

Rated voltage [kV] (Max. system voltage)	27	38
Rated current [A]	600	600
Short time withstand current (1 or 3 s) [kA]	25	25
Insulation level:		
Power frequency (1 min) [kV]	50	50
Lightning impulse [kV _{peak}]	125	150
Making capacity [kA _{peak}]	40	40
Breaking capacity [kA]	25	25

7.9 Yaw System

Type: Plain bearing system with built-in friction
 Material: Forged yaw ring heat-treated. Plain bearings PETP
 Yawing speed: <0.5°/sec

7.10 Yaw Gears

Type: 4-step planetary gear with motor brake
 Motor: 2.2 kW, 4 pole, asynchronous

7.11 Gearbox

Type: 2 planetary stage + 1 helical stage
 Type no.: EF901AE55-K1
 Shaft distance: 461 mm
 Ratio: 1:109.0 (60 Hz)

7.12 Parking Brake

Type: PZ.I.4420.2802.10
 Brake Pad type: MPM 030
 Supply: Separate hydraulic pump unit

7.13 Hydraulics

Pressure: 250 bar
 Placement: The complete hydraulic system is mounted in the hub.

7.14 Cooling System

Gear oil cooling: 2 water/air cooling units located above the transformer room. Connected to the oil/water heat exchanger located by the gear oil tank.

Generator cooling: 2 water/air coolers located above the transformer room.
 Water-cooling: Coupled on generator cooler.
 Transformer cooling: Cooling air is blown through the windings from the bottom of the transformer.

Nacelle cooling: Cooling of the nacelle is done by leading air through the glassfibre floor behind the tower. Outgoing air is led through a fan to the transformer room and is later blown out at the rear end of the nacelle. The air intake is controlled by a flap valve, which opens when the nacelle temperature reaches a certain level.

7.15 Nacelle Bedplate

Front part:	Spheroidal graphite iron GJS-400-18U-LT Foundation for gear, generator, yaw bedding, crane-girders and rear foundation.
Weight:	8500 kg
Rear part:	Welded gratings integrated with crane girders. Foundation for electrical panels, transformer and cooling room.

7.16 Nacelle

Material:	Fibreglass
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7.17 Tower

Type:	Conical tubular
Material:	S355
Surface treatment:	Painted
Corosion class, outside:	C4 (ISO 12944-2)/offshore C5-M
Corosion class, inside:	C3 (ISO 12944-2)/offshore C4
Top diameter for all towers:	2.3 m
Bottom diameter for all towers:	3.98 m
	Hub Height
3-parted, modular tower	65 m
3-parted, modular tower	80 m

The exact hub height listed includes 0.55 m distance from the foundation section to the ground level and 2.0 m distance from the tower top flange to the hub center.

7.18 Weight and Dimensions

7.18.1 Nacelle

Including hub and nose cone:	
Length:	13.25 m
Width:	3.6 m
Height:	4.05 m
Weight app.	88000 kg +/- 3000 kg

Without hub and nose cone:	
Length:	9.65 m
Width:	3.6 m
Height:	4.05 m
Weight app.:	68000 kg +/- 2000 kg

7.18.2 Gearbox

Length: 2100 mm
 Diameter: 2600 mm
 Weight max.: 23000 kg

7.18.3 Generator

Length max.: 2800 mm
 Diameter max.: 1100 mm
 Weight max: 8500 kg

7.18.4 Transformer

Length: 2340 mm
 Width: 1090 mm
 Height: 2150 mm
 Weight max.: 8000 kg

7.18.5 Rotor Blades

Length: 44 m
 Weight : 6600 kg/pcs +/- 400 kg.

7.18.6 Switch Gear, Feeder Function (Option)

Rated voltage [kV]	24	36
Width [mm]	370	420
Height [mm]	1400	1800
Depth [mm]	850	850
Weight [kg]	135	140

7.18.7 Switch Gear, Circuit Breaker Function (Option)

Rated voltage [Kv]	24	36
Width [mm]	480	600
Height [mm]	1400	1800
Depth [mm]	850	850
Weight [kg]	218	238

8. General Reservations, Notes and Disclaimers

- All data are valid at sea level ($\rho=1.225 \text{ kg/m}^3$).
- Periodic operational disturbances and generator power de-rating may be caused by combination of high winds, low voltage or high temperature.
- Vestas recommends that the electrical grid be as close to nominal as possible with little variation in frequency.
- A certain time allowance for turbine warm-up must be expected following grid dropout and/or periods of very low ambient temperature.
- If the wind turbine is sited at elevations greater than 1000 m (3300 ft) above sea level, a higher than usual temperature rise may occur in electrical components. In such cases, a periodic power reduction from rated electrical output may occur. This may occur even when the ambient temperature remains within specified limits.
- Furthermore, sites situated at greater than 1000 m (3300 ft.) above sea level usually experience an increased risk of icing in most climates.
- Because of continuous development and product upgrade, Vestas reserves the right to change or alter these specifications at any time.
- All listed start/stop parameters (e.g. wind speeds and temperatures) are equipped with hysteresis control. This can, in certain borderline situations, result in turbine stops even though the ambient conditions are within the listed operation parameters.

9. Performance Note

THE PERFORMANCE OF THE VESTAS V90-3.0 MW WIND TURBINES CAN AND WILL VARY DEPENDING ON NUMEROUS VARIABLES, MANY OF WHICH ARE CONSIDERED AS PART OF THE PERFORMANCE MEASUREMENT STANDARD SET FORTH IN THESE GENERAL SPECIFICATIONS. MANY OF THESE VARIABLES INCLUDING, BUT NOT LIMITED TO, SITE LOCATION, INSTALLATION, TURBINE CONDITION, TURBINE MAINTENANCE AND ENVIRONMENTAL/CLIMATIC CONDITIONS ARE BEYOND THE CONTROL OF VESTAS. UNLESS OTHERWISE CONTRACTUALLY AGREED IN WRITING, ALL PERFORMANCE SPECIFICATIONS SET FORTH IN THESE GENERAL SPECIFICATIONS INCLUDING, BUT NOT LIMITED TO, POWER CURVES, ANNUAL PRODUCTIONS AND NOISE EMISSIONS SHOULD BE USED FOR GUIDANCE ONLY, AND NOT AS A PREDICTOR OR GUARANTEE OF FUTURE PERFORMANCE. FOR ADDITIONAL INFORMATION REGARDING THE INSTALLATION, MAINTENANCE AND PERFORMANCE OF THE VESTAS V90-3.0 MW WIND TURBINES, PLEASE CONTACT VESTAS DIRECTLY.

Attachment 5

Modeling Corrections Based on Field Data

Modeling Corrections Based on Field Data

1 Calibration of Default Modeling Parameters (Audible Range)

The standard noise modeling SPL data provided by Vestas for the V90 was field checked for modeling by using data gathered at various locations relative one isolated V90 WTG.

The Vestas Modeling curve was based on the 1/1 Octave noise profile for other similar Large WTG units mapped to conform to the maximum Hub Center dBA value provided by Vestas. The source file data below shows the Vestas default value.

Source No : 1

Source TITLE: 2011A #1 v90 3.0 hh260ft 30fps

Information

Test Unit modeling calibration (default, uncorrected for field data)

Type = POINT

Coordinates x = 5789., y = 5999., z = 4160.

	FREQUENCY HZ									
Lin/Awt	31.5	63	125	250	500	1k	2k	4k	8k	16k
110.1										
PWL	81	90	101	103	105	103	101	95	86	78
107.7										

The resultant data showed that the Vestas standard SPL when used in complex finite element modeling consistently over estimated impacts when compared to field data. This has been the findings of past noise studies and is again assumed to be reflective of the normal practice for equipment manufacturers to use design factors and margins for contractual considerations such as warranty. In the absence of reliable field noise and met data one could use the Vestas standard data and provide overly conservative estimates of impact but the estimate would be inaccurate. The preferred modeling technique relies on calibrated models using field verified data that is reflective of the local terrain and flora.

TerraGen selected a recently installed Vestas V90 unit that was relatively isolated. See figure below.

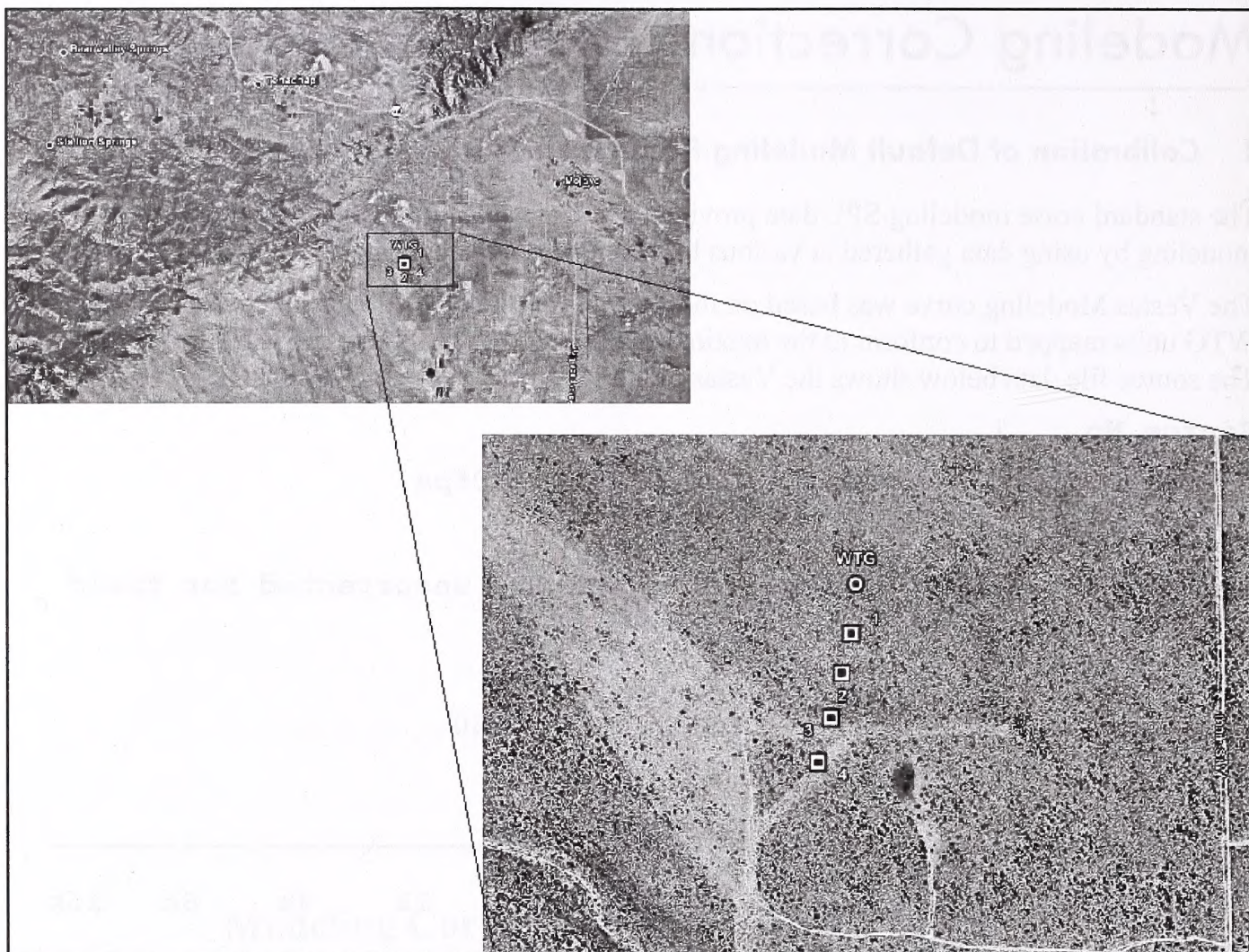


Figure 1: Test Location and Detail for Monitor Locations 1, 2, 3 and 4

Data were gathered for this purpose at the direction of TerraGen, see **Attachment 2, Monitoring Data**. The profile was adjusted to reflect the z-weighted 1/3 Octave Band data which was back calculated to the Hub Center and converted to 1./1 Octave band data. Figure 2, below shows the 1/3 Octave Z weight data for all directions of wind, the average and for the 20 highest wind speeds.

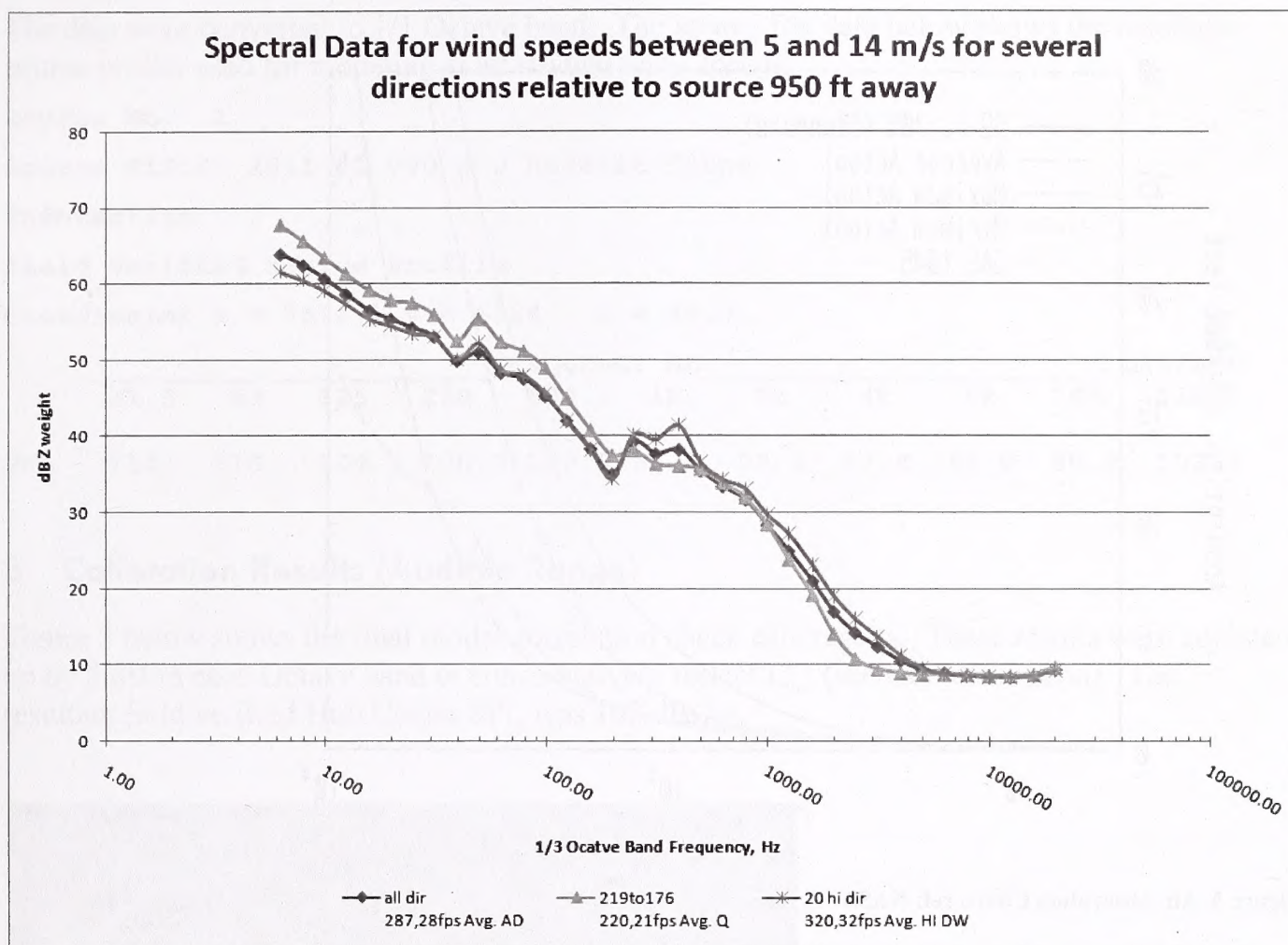


Figure 2

2 Calibration Method (Audible Range)

These noise data were correlated to time-tagged met data (i.e. wind speed and direction). The model source was correlated to the data for the farthest meter location (950 feet from the WTG).

These data were converted to dBA and normalized to 1/1 Octave band values. Model iterations were performed in the finite element model to vary the hub center Sound Power Level using the normalized curve to establish a SPL profile that gave results that were reflective of the field data in the specific regional terrain and flora. The starting point was an SPL based on general radiative calculations using $Q=2$ and no absorption.

$$dB_2 = dB_1 - 20 \log((2/1)^2)$$

It is important to note that higher frequencies (i.e. $f > 1000\text{Hz}$) have a very high air attenuation and the resultant field gathered WTG Sound Pressure (noise) data will rapidly diminish in strength and is ultimately overwhelmed by ambient noise at these frequencies, see chart below.

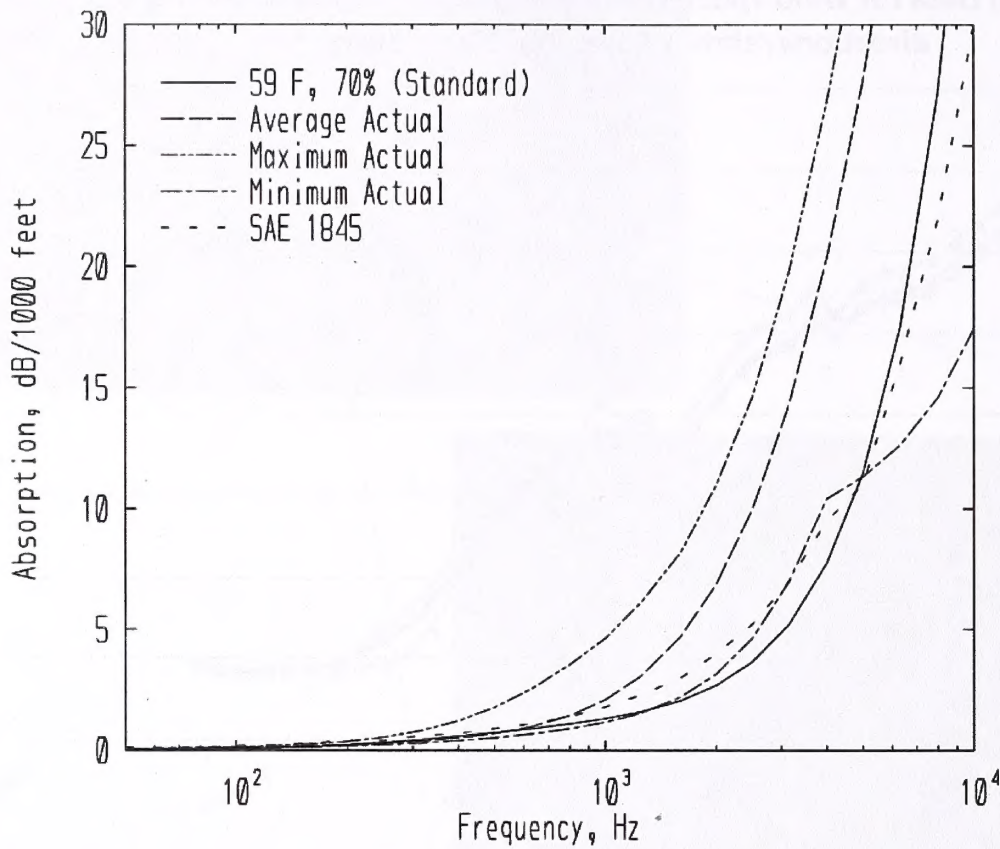


Figure 3: Air Absorption Chart, ref: NASA

“A-weighting” of data is not heavily skewed in frequencies above 1000 Hz but the stronger WTG Sound Pressure in A-weighted center bands tends to define the average A-weighted results.

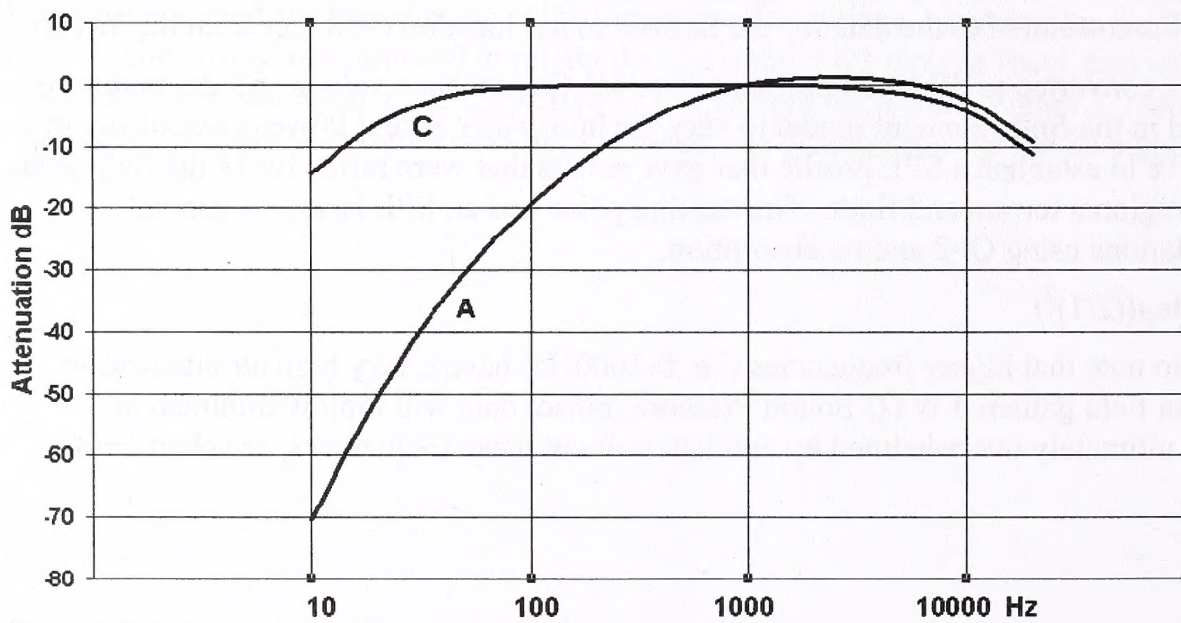


Figure 4: Noise Weighting Chart

The data were converted to 1/1 Octave band. The source file data below shows the resultant source profile used for modeling at all studied wind speeds.

Source No: 1

Source TITLE: 2011 #1 v90 3.0 hh360ft 30fps

Information

Field Verified Source Profile

Coordinates x = 7671., y = 6024., z = 4010.

	FREQUENCY HZ										Lin/Awt
	31.5	63	125	250	500	1k	2k	4k	8k	16k	116.1
PWL	114	110	104.5	100.9	100.8	96.6	93.6	87.4	83.8	80.2	102.3

3 Calibration Results (Audible Range)

Figure 5 below shows the final model correlation check calc results. These results were adjusted up by 5 dB in each Octave band to conservatively reflect $L_{8.3}$ (see later discussion). The resultant field verified Hub Center SPL was 102 dB(A).

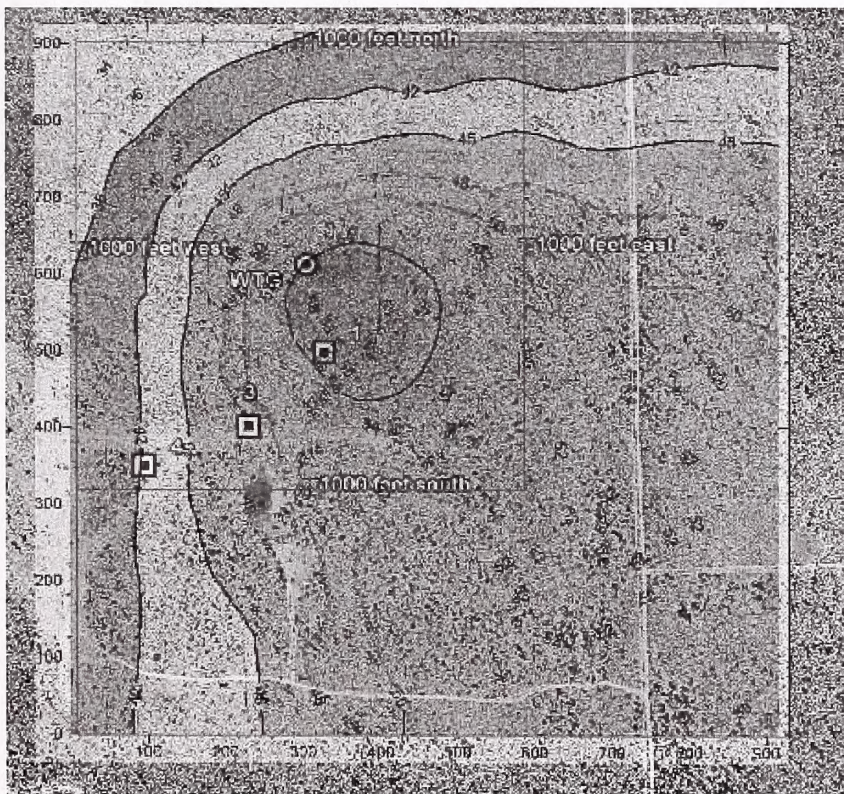


Figure 5: Modeling Calibration Results

Figure 6, below, shows the plot of the L_1 , $L_{8.3}$ and L_{50} data for all recorded 1/3 Octave band frequencies. There is consistently less than 5 dB difference between L_1 and L_{50} .

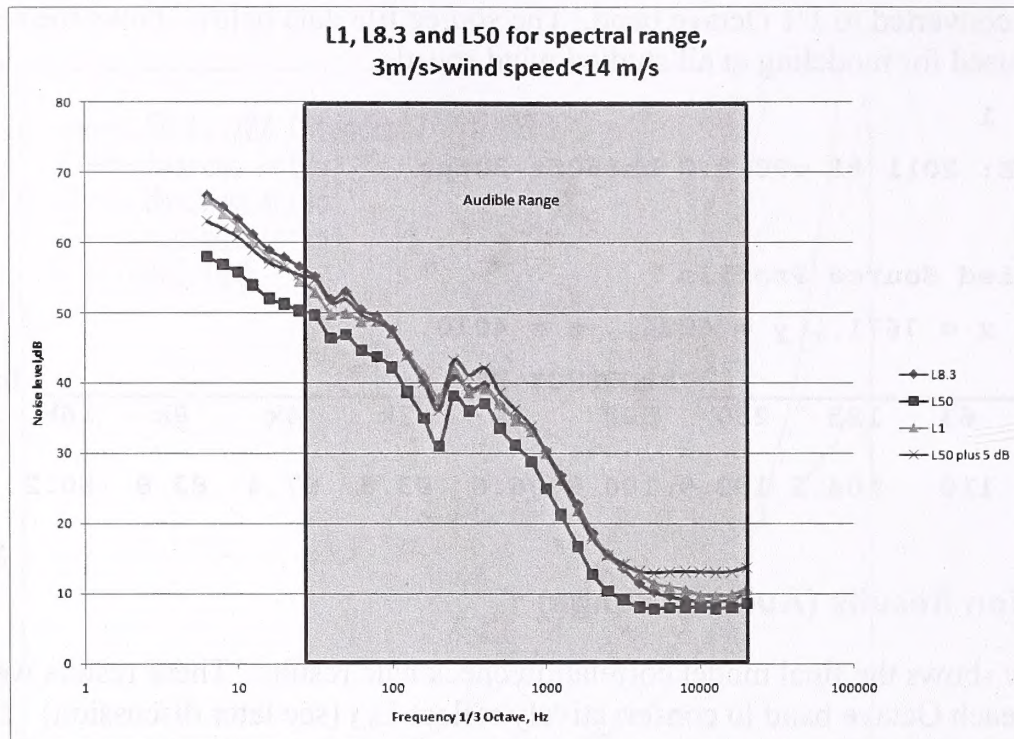


Figure 6: Field Data for field monitor locate 954 feet from WTG center line.

Adding 5 dB to the model results in a higher modeling dB(A) result due to the higher Sound Pressure Levels (dB) in the 250 to 1000 Hz range, where values are high (relative to Sound Pressure Levels above 1000 to 20000Hz) and the effect of A-weighting is minimal. L_{8.3} or L₁ based modeling dB(A) results (have lower actual values in the 250 to 1000Hz range). The chart below shows the model results at 30 fps from 312 degrees as compared to monitoring station noise levels at varying wind speeds above 8 m/s in the prevailing wind direction.

**Audible noise data for 300 to 325 deg ws > 8 m/s (27fps)
and Model results for 312 degrees at 30 fps (backcalculated
L50 plus 5dB)**

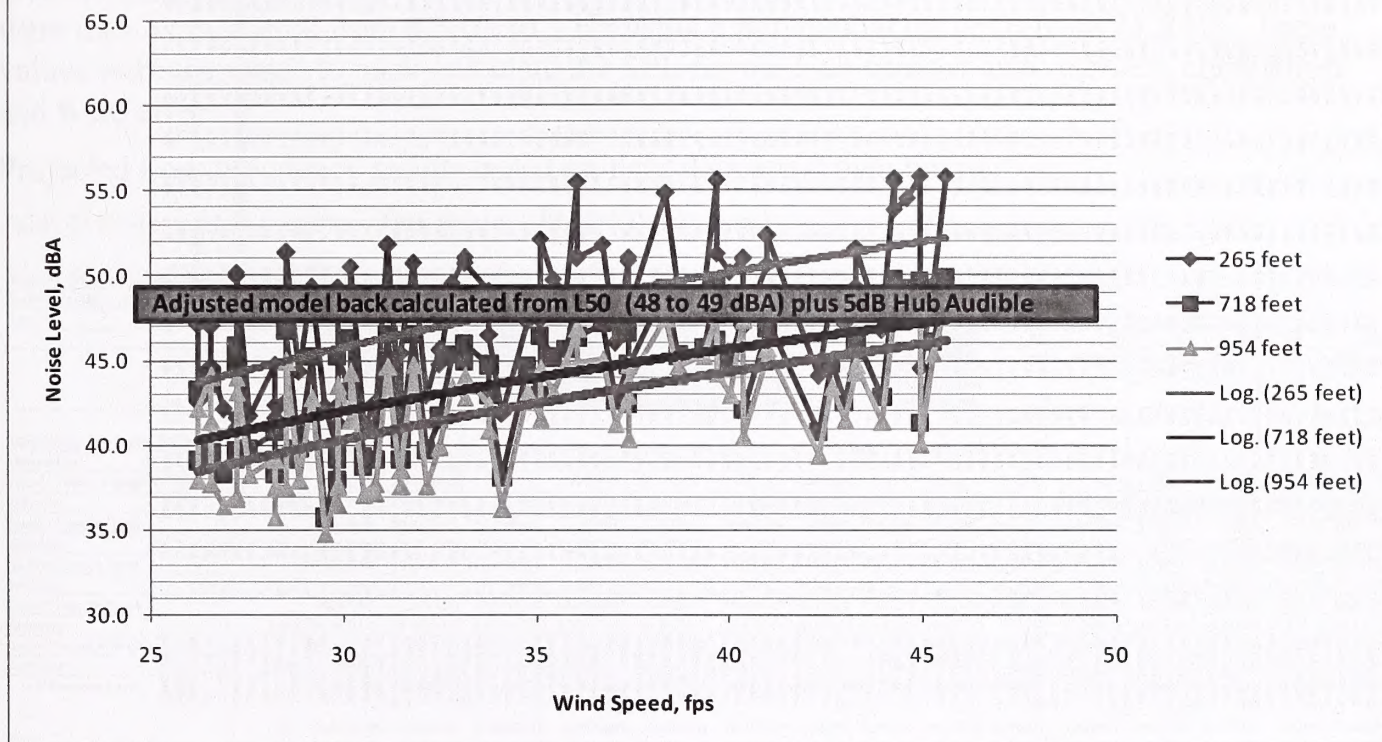


Figure 7: Model results using 30 fps SPL compared to field meters as a function of wind speed for prevailing wind direction

4 Infra Sound (Ultra Low Frequency) Analysis

Field data were gathered for operational checks against time tagged met conditions. The 1/3 Octave data for various sample periods were gathered and checked against Kern County Wind Energy Ordinance requirements, see **Table 1**. It was determined that the measured far-field location at 954 feet from the base of the hub for wind speeds between 3 m/s and 9m/s only exceeded the county low frequency limits by fractions of a dB or in some rare instances 1dB.

In general, assuming the simplified Rule-of-Thumb the Sound Pressure Levels at 1000 feet would be reduced by 6dB at 2000 feet, resulting in compliant low frequency values at 2000 feet for every subject low frequency band in the **Table 1**. However, a more rigorous screening analysis has been performed.

Additionally, some measured exceedance values may be attributed to passing field vehicles during certain times of the day (i.e., rounds, shift change, lunch etc.). There is no clear pattern at 954 feet (nominal 1000 feet) to indicate that there is a pattern of low frequency impacts. Receptors located farther than 1000 feet from WTG units are not expected to experience any greater low frequency impacts. However, to ensure that the analysis of proper setback from sensitive receptors is sufficient to ensure no impacts, these field data were analyzed to establish a hub SPL for each frequency in the county WE Ordinance. A far-field calculation was then performed to determine a safe distance at which sensitive receptors are no subject to Low Frequency impacts.

Table 1: Time tagged field measured noise data and met data

[illegible]

Kern County exceedances are highlighted in red

2/140111-10-PM	63	250	3310	683	331	562	616	627	581	542	578	585	519	571	336	320	482	446
2/140111-15-PM	63	260	3310	683	330	563	510	544	514	544	578	585	490	502	567	320	482	446
2/140111-18-PM	75	246	3350	667	663	563	511	537	511	549	528	490	501	476	471	466	427	427
2/140111-30-PM	75	246	3370	666	663	567	603	586	562	563	549	553	519	557	524	520	493	493
2/140111-1-PM	67	220	2370	600	578	587	545	528	529	542	516	430	491	469	463	463	412	412
2/140111-4-PM	67	220	2410	682	561	618	609	579	560	549	526	498	524	499	463	464	404	404
2/140111-15-PM	31	102	2500	563	532	544	504	473	467	442	423	378	364	340	356	318	318	318
2/140111-18-PM	62	203	2510	716	712	696	671	643	608	583	575	511	608	566	555	311	311	311
2/140111-1-PM	31	113	3460	765	761	751	711	682	657	632	617	554	657	615	554	311	311	311
2/140111-4-PM	40	311	3660	335	315	327	315	327	479	467	462	429	419	423	378	448	366	366
2/140111-10-PM	54	177	3650	544	547	544	525	563	543	464	459	421	396	393	364	356	340	340
2/140111-15-PM	64	134	3680	648	625	606	583	563	537	541	511	437	470	452	488	423	488	423
2/140111-18-PM	39	128	3690	618	616	593	566	547	519	520	506	478	467	459	467	411	467	411
2/140111-1-PM	43	141	2700	607	586	550	538	526	518	501	487	462	451	450	407	405	407	405
2/140111-4-PM	33	110	2710	753	733	711	686	657	627	600	576	554	597	548	541	507	477	477
2/140111-10-PM	33	110	2710	752	731	711	685	656	627	600	576	554	597	548	541	507	477	477
2/140111-15-PM	61	200	2840	633	622	595	575	559	541	524	504	511	490	461	449	412	412	412
2/140111-18-PM	61	200	2840	633	622	595	575	559	541	524	504	511	490	461	449	412	412	412
2/140111-1-PM	54	177	2850	639	622	582	570	552	554	537	509	499	491	461	449	412	412	412
2/140111-4-PM	54	177	2850	639	622	582	570	552	554	537	509	499	491	461	449	412	412	412
2/140111-10-PM	57	187	2950	559	549	543	509	478	461	452	446	412	415	405	365	332	366	332
2/140111-15-PM	70	230	2950	586	561	542	527	510	494	480	483	451	442	431	366	332	366	332
2/140111-18-PM	33	108	2980	534	531	507	561	511	512	499	470	467	462	460	403	371	392	392
2/140111-1-PM	66	217	2790	629	607	538	512	511	522	499	504	478	467	462	404	405	405	405
2/140111-4-PM	61	200	2749	510	517	514	500	491	466	466	458	433	44	404	405	385	385	385
2/140111-10-PM	62	203	2760	577	570	569	515	512	498	502	491	412	412	412	396	385	385	385
2/140111-15-PM	62	203	2760	577	570	569	515	512	498	502	491	412	412	412	396	385	385	385
2/140111-18-PM	77	253	2780	581	567	569	542	517	506	502	491	461	448	431	403	376	376	376
2/140111-1-PM	72	238	2890	563	550	551	532	507	492	486	475	448	431	404	431	404	431	404
2/140111-4-PM	70	230	3000	569	560	550	534	512	498	489	467	447	430	426	410	388	388	388
2/140111-10-PM	74	243	3000	582	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-15-PM	80	262	3000	583	576	562	535	520	530	521	508	460	473	429	437	395	373	373
2/140111-18-PM	91	299	3000	578	572	552	530	521	512	506	460	471	446	404	388	381	356	356
2/140111-1-PM	91	299	3010	556	519	517	512	498	490	478	471	412	411	411	410	420	420	420
2/140111-4-PM	91	299	3010	556	519	517	512	498	490	478	471	412	411	411	410	420	420	420
2/140111-10-PM	71	213	3010	562	548	548	525	506	495	486	460	430	416	412	312	312	312	312
2/140111-15-PM	71	213	3010	562	548	548	525	506	495	486	460	430	416	412	312	312	312	312
2/140111-18-PM	61	200	3010	563	547	547	525	504	493	484	453	410	397	373	363	363	363	363
2/140111-1-PM	61	200	3010	563	547	547	525	504	493	484	453	410	397	373	363	363	363	363
2/140111-4-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-10-PM	91	299	3050	589	568	568	548	524	515	505	497	471	464	454	424	392	392	392
2/140111-15-PM	76	249	3060	609	578	578	558	534	525	516	506	481	432	442	418	413	413	413
2/140111-18-PM	77	253	3060	585	565	565	545	521	512	502	492	471	461	451	421	404	404	404
2/140111-1-PM	81	286	3060	642	614	581	574	555	532	516	500	477	464	464	406	406	406	406
2/140111-4-PM	33	110	3070	576	566	563	512	490	485	477	460	445	417	411	419	381	381	381
2/140111-10-PM	81	286	3070	576	566	563	512	490	485	477	460	445	417	411	419	381	381	381
2/140111-15-PM	83	292	3070	559	530	535	518	502	495	488	460	425	416	416	416	416	416	416
2/140111-18-PM	81	282	3050	580	573	562	515	497	493	486	458	412	406	406	406	406	406	406
2/140111-1-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-4-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-10-PM	91	299	3050	589	568	568	548	524	515	505	497	471	464	454	424	392	392	392
2/140111-15-PM	76	249	3060	609	578	578	558	534	525	516	506	481	432	442	418	413	413	413
2/140111-18-PM	77	253	3060	585	565	565	545	521	512	502	492	471	461	451	421	404	404	404
2/140111-1-PM	81	286	3060	642	614	581	574	555	532	516	500	477	464	464	406	406	406	406
2/140111-4-PM	33	110	3070	576	566	563	512	490	485	477	460	445	417	411	419	381	381	381
2/140111-10-PM	81	286	3070	576	566	563	512	490	485	477	460	445	417	411	419	381	381	381
2/140111-15-PM	83	292	3070	559	530	535	518	502	495	488	460	425	416	416	416	416	416	416
2/140111-18-PM	81	282	3050	580	573	562	515	497	493	486	458	412	406	406	406	406	406	406
2/140111-1-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-4-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-10-PM	91	299	3050	589	568	568	548	524	515	505	497	471	464	454	424	392	392	392
2/140111-15-PM	76	249	3060	609	578	578	558	534	525	516	506	481	432	442	418	413	413	413
2/140111-18-PM	77	253	3060	585	565	565	545	521	512	502	492	471	461	451	421	404	404	404
2/140111-1-PM	81	286	3060	642	614	581	574	555	532	516	500	477	464	464	406	406	406	406
2/140111-4-PM	33	110	3070	576	566	563	512	490	485	477	460	445	417	411	419	381	381	381
2/140111-10-PM	81	286	3070	576	566	563	512	490	485	477	460	445	417	411	419	381	381	381
2/140111-15-PM	83	292	3070	559	530	535	518	502	495	488	460	425	416	416	416	416	416	416
2/140111-18-PM	81	282	3050	580	573	562	515	497	493	486	458	412	406	406	406	406	406	406
2/140111-1-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-4-PM	95	295	3050	585	561	561	541	517	507	499	489	461	432	440	418	413	413	413
2/140111-10-PM	91	299	3050	589	568	568	548	524	515	505	497	471	464	454	424	392	392	392
2/140111-15-PM	76	249	3060	609	578	578	558	534	525	516	506	481	432	442	418	413	413	413
2/140111-18-PM	77	253	3060	585	565	565	545	521	512	502	492	471	461	451	421	404	404	404
2/140111-1-PM	81	286	3060	642	614	581	574	555	532	516	500	477	464	464	406	406	406	406
2/140111-4-PM	33	110	3070	576	566	563	512	490	485	477	460	445	417	411				

Low Frequency Profile

Conservatively, low frequency $L_{8.3}$ data were sorted for the range of operation of the WTGs to ensure only WTG noise was being used and there was no low wind speed bias (i.e., 3 m/s and greater). $L_{8.3}$ data were selected since will return higher values as opposed to L_{eq} . The results were then extrapolated from 6.3 Hz to 1 Hz using a polynomial curve fit from 31.5 Hz. These values were then used to back-calculate the SPL for the Hub using radiative effect, attenuation and wind effect.

Projected Low Frequency results based on field data are shown below.

Table 2: Projected low frequency Hub Center SPL, 1/3 Octave band

Adjusters for Low frequency see County sheet			8.44552858	3.1739854	3.44153417 Base															
Loudest Possible noise			Extrapolate to 4,2 and 1																	
Hub SPL			Use L8.3 for highest low frequency noise modeling																	
		Hz	1	2	4	6.3	8	16	20	25	31.5	40	50	63	80	100	125			
		Low Freq. Noise	130.284493	128.454484	125.280498	121.838964	120.252725	118.49122	116.2995	114.0656	113.0173	111.7478	110.271203	107.0608	108.133	105.59	104.6516			
	Q																			
		dB/1000ft	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
Wind Effect (downwind @10m/s)																				
Attenuation																				
1E-08x³ + 8E-06x² + 8E-06x + 0.000			8.005E-06	3.7898E-06	1.2368E-05	2.7344E-05	4.0897E-05	0.0001525	0.000231	0.000347	0.000532	0.000847	0.00130518	0.002044	0.003167	0.005146	0.007877			
Radiation			2	250	84.8426399	83.0126308	79.8386454	76.3971113	74.810872	73.049371	70.85767	68.62371	67.57549	66.30592	64.8293499	61.61894	62.69118	60.14814	59.20979	
Sound Pressure Level					87.8426319	86.0126271	82.8386331	79.3970839	77.8108311	76.049218	73.85744	71.62336	70.57495	69.30507	67.8280447	64.61689	65.68802	63.143	62.20191	
Radiation				500	78.8220399	76.9920309	73.8180455	70.3765114	68.7902721	67.028771	64.83707	62.60311	61.55489	60.28532	58.80875	55.59834	56.67058	54.12754	53.18919	
Sound Pressure Level					81.8220319	79.9920271	76.8180332	73.376484	71.7902312	70.028619	67.83684	65.60276	64.55435	63.28448	61.8074448	58.59629	59.66742	57.1224	56.18111	
Radiation				2	1000	72.80144	70.971431	67.7974456	64.3559114	62.7696722	61.008171	58.81647	56.58251	55.53429	54.26472	52.78815	49.57774	50.64998	48.10694	47.16859
Sound Pressure Level					75.801432	73.9714272	70.7974332	67.3558841	65.7696313	64.008019	61.81624	59.58216	58.53375	57.26388	55.7868449	52.57569	53.64682	51.1018	50.16071	
Radiation				1	1500	66.2693149	64.4393059	61.2653205	57.8237863	56.2375471	54.476046	52.28434	50.05038	49.00216	47.7326	46.2560249	43.04561	44.11786	41.57482	40.63646
Sound Pressure Level					69.2693069	67.4393021	64.2653081	60.823759	59.2375062	57.475893	55.28411	53.05004	52.00163	50.73175	49.2547197	46.04357	47.11469	44.56967	43.62858	
Radiation				1	2000	63.7705402	61.9405312	58.7665457	55.3250116	53.7387723	51.977271	49.78557	47.55161	46.50339	45.23382	43.7572502	40.54684	41.61908	39.07604	38.13769
Sound Pressure Level					66.7705322	64.9405274	61.7665334	58.3249842	56.7387314	54.977119	52.78534	50.55126	49.50285	48.23298	46.755945	43.54479	44.61592	42.0709	41.12981	
				1	2	4	6.3	8	16	20	25	31.5	40	50	63	80	100	125		
		250		70	70					68	67	65	62	60	57	55	52	50		
		500		70	70					68	67	65	62	60	57	55	52	50		
		1000		70	70					68	67	65	62	60	57	55	52	50		
		1500		70	70					68	67	65	62	60	57	55	52	50		
		2000		70	70					68	67	65	62	60	57	55	52	50		

The data points that were used to extrapolate to 1 Hz are shown in green.

The resultant plot of all relevant Sound Power Level data is shown below.

Field Verified Vestas V90 3.0MW WTG Hub Noise Levels for Low and Audible Noise Modeling

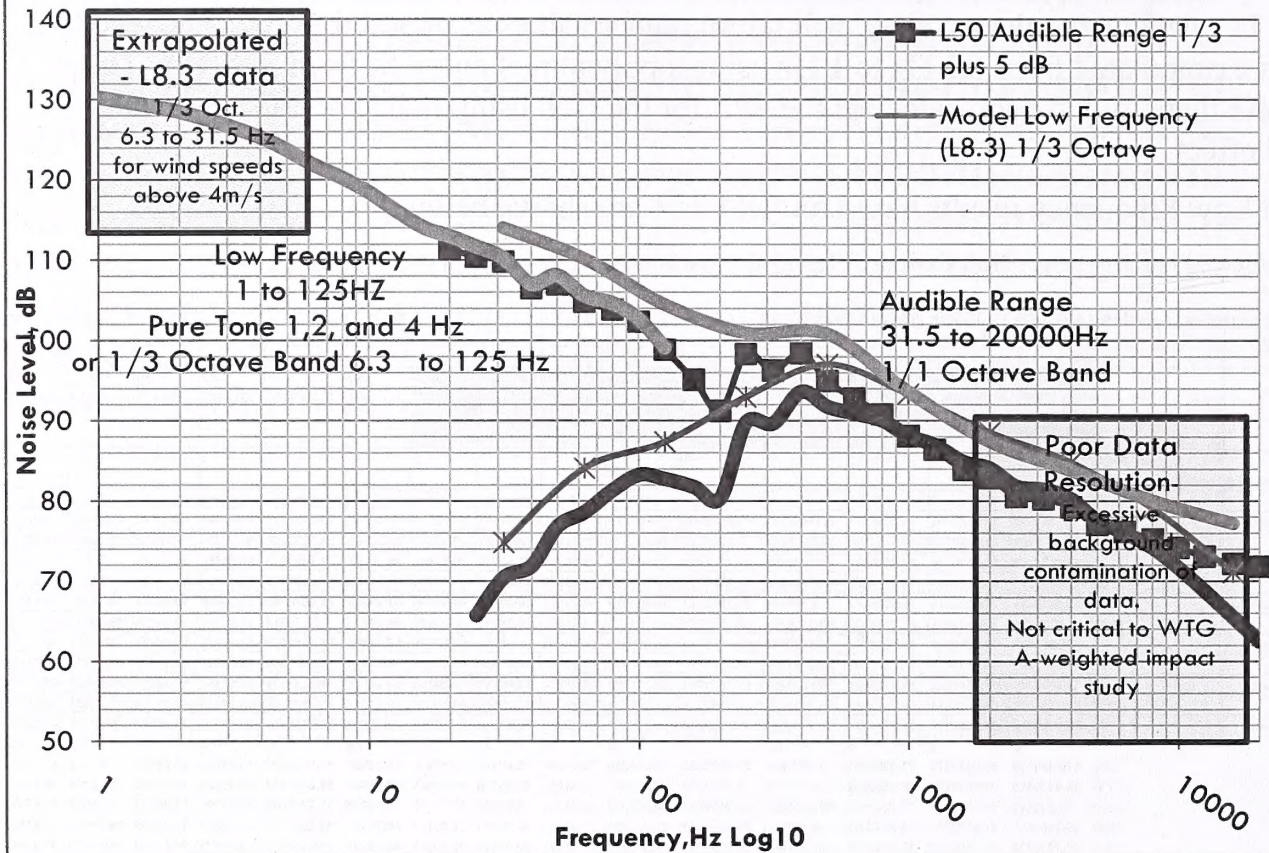


Figure 8: Combined curves reflecting field data back calculated to Hub Center.

Using the corrected Hub SPL based on $L_{8.3}$ as opposed to L_{eq} , the impacts of L_{eq} for each subject low-frequency were conservatively calculated as a function of distance.

Note that the corrected low frequency curve deviated from the empirically derived curve for L_{50} starting at 50Hz. The extrapolation of $L_{8.3}$ conservatively assumed that the L_{eq} (weighted mean) is the same as the L_{50} (median) and $L_{8.3}$.

A conservative set of screening criteria were thus established. The most sensitive test was for the 1Hz frequency which meets the county criteria at approximately 1500 feet. After reviewing the screening criteria TerraGen elected to remove one WTG located along the eastern boundary of Section 28 T32S R35E to meet this screening L_{eq} criterion.

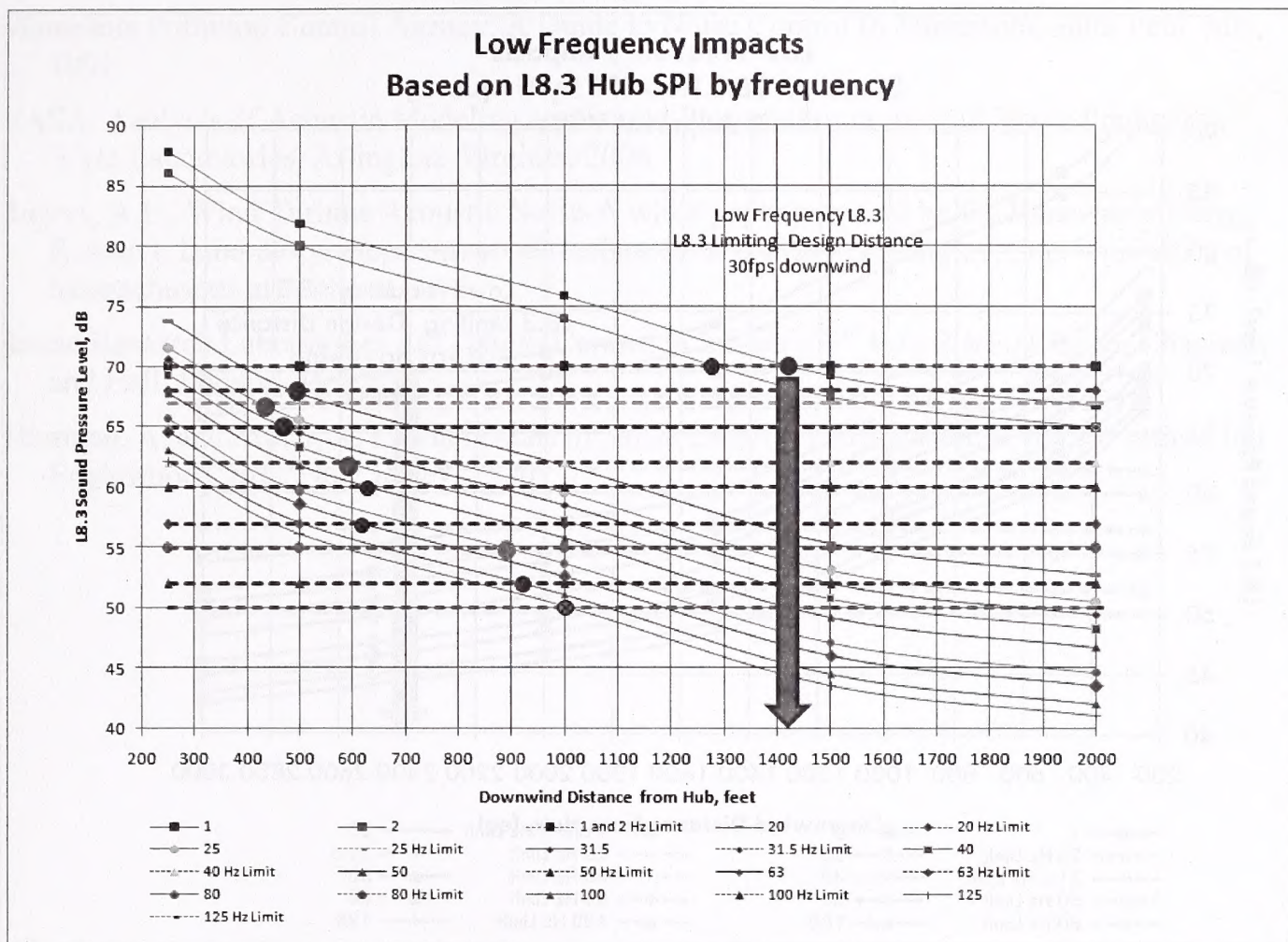


Figure 9: Screening Model, 1 unit and multiple units in line with wind direction

Figure 10 below shows the results when three Vestas V90 3.0 MW units are operating at 30 fps with winds blowing tangentially to their orientation. The three units are relatively equidistant on a far-field basis and the equal impacts are algebraically added together.

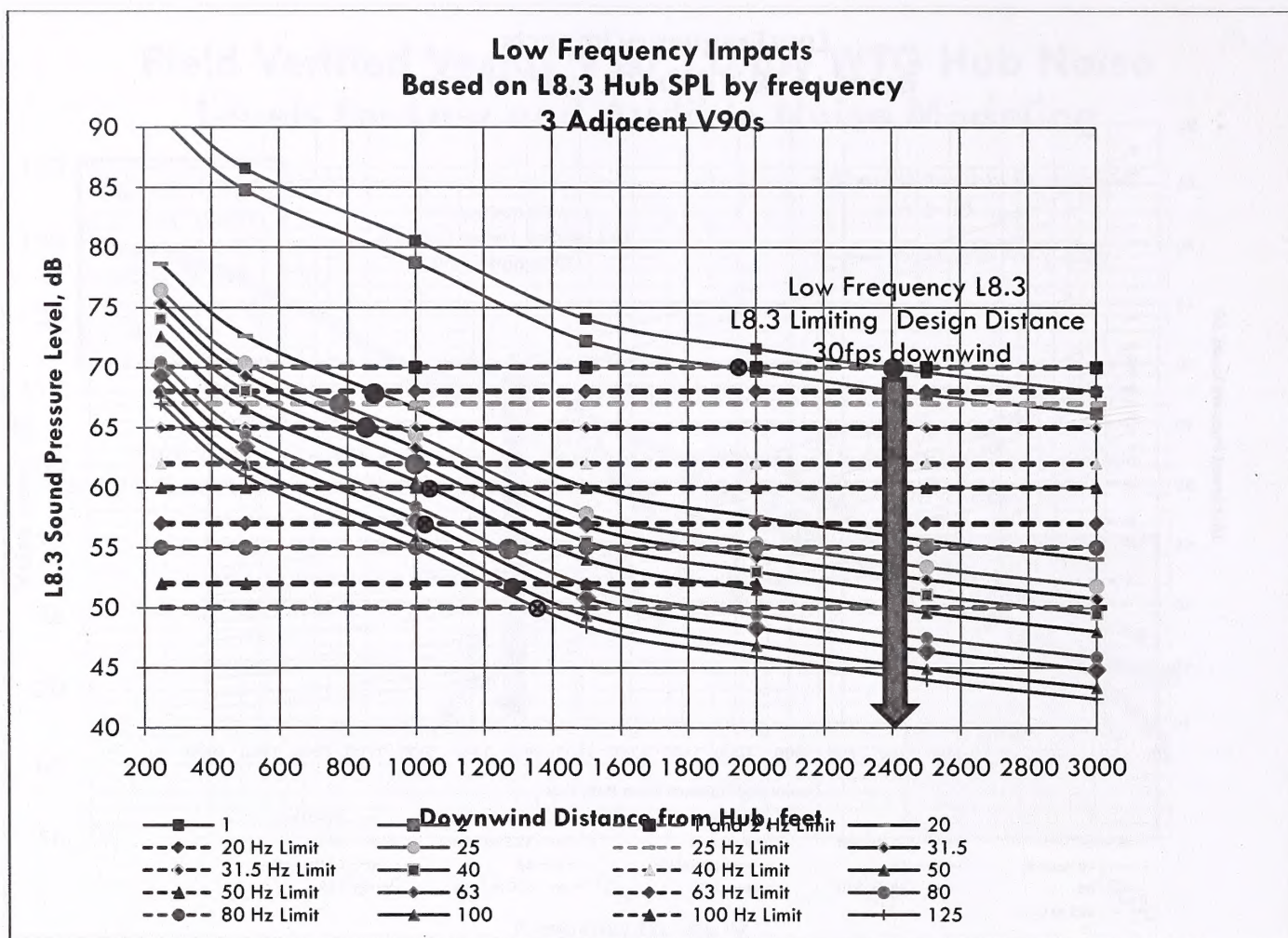


Figure 10 Screening Model, 3 Units tangential to wind direction

5 References

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Appendix G

Air Quality

Air Quality and Greenhouse Gas Technical Report for the Alta East Wind Project

Prepared for
Alta Windpower Development, LLC

April 2011

CH2MHILL

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Acronyms and Abbreviations

°F	degrees Fahrenheit
µg/m ³	micrograms per cubic meter
AB	Assembly Bill
ADAM	Aerometric Data Analysis and Management System
Almanac	California Almanac of Emissions and Air Quality
ARB	California Air Resources Board
AWD	Alta Windpower Development, LLC
BLM PEIS	<i>BLM Wind Energy Programmatic Environmental Impact Statement</i>
BMP	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CEQA	California Environmental Quality Act
CH ₄	Methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
COG	Council of Governments
EKAPCD	Eastern Kern Air Pollution Control District
EPA	U.S. Environmental Protection Agency
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gas
HFC	hydrofluorocarbons
KCGP	Kern County General Plan
LADWP	Los Angeles Department of Water and Power
MDA	Master Development Agreement
MDAB	Mojave Desert Air Basin

MW	Megawatt(s)
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO	nitric oxide
NO ₂	nitrogen dioxide
NO _x	oxides of nitrogen
OEHHA	Office of Environmental Health Hazard Assessment
PFC	perfluorocarbons
PM ₁₀	particulate matter less than 10 microns in aerodynamic diameter
PM _{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
ppm	parts per million
project	Alta East Wind Project
PVC	polyvinyl chloride
RES	renewable energy standard
ROG	reactive organic gas
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SCE	Southern California Edison
SF ₆	sulfur hexafluoride
SIP	state implementation plan
SO	sulfur oxide
SO ₂	sulfur dioxide
SO _x	oxides of sulfur
TAC	toxic air contaminants
TCM	transportation control measure
tpy	tons per year
VOC	volatile organic compounds

Executive Summary

Project Summary

Alta Windpower Development, LLC (AWD), proposes to construct the Alta East Wind Project (project) in southeastern Kern County, California. The wind energy facility would include up to 120 wind turbine generators capable of generating up to 360 megawatts of power. The project would be located on approximately 3,200 acres on the north and south sides of State Route 58, approximately 3 miles northwest of the town of Mojave and approximately 11 miles east of the city of Tehachapi. Two options, Option A and Option B, have been identified for the turbine layout on the project site. One turbine layout will ultimately be selected during final design and constructed. In addition, a bridge design (Bridge Access Option) across the Los Angeles Department of Water and Power (LADWP) aqueduct is being considered by AWD for site access. A portion of the project site would be located on privately owned land and the remainder on federal land managed by the U.S. Bureau of Land Management. Construction of the project would begin in the spring of 2012 and completed by the end of that year.

Results and Conclusions

Section 3 of this report provides the air quality impact assessment for the project. Both Options A and Option B were considered in the assessment, however, the conclusions for both options are the same. Construction and operation of the project were evaluated for emissions of carbon monoxide (CO), oxides of nitrogen (NO_x), reactive organic gases (ROG), oxides of sulfur (SO_x), particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), and particulate matter less than 2.5 microns in aerodynamic diameter (PM_{2.5}). The Eastern Kern Air Pollution Control District (EKAPCD¹) significance thresholds were used to determine whether construction or operations emissions would result in a significant impact to air quality. Based on the anticipated construction schedule and activities, construction would result in a less-than-significant impact for emissions of CO, ROG, SO_x, and PM_{2.5}. Mitigation measures AQ-1 and AQ-2 would be implemented to reduce NO_x and PM₁₀ emissions during construction. In addition, construction equipment would be equipped with engines meeting the Tier 3 emission standards. However, mitigated NO_x and PM₁₀ emissions from the short construction period (9 to 12 months) would result in a temporary significant and unavoidable impact on air quality.

Operation of the project would result in a less-than-significant impact to air quality from emissions of CO, NO_x, ROG, SO_x, PM₁₀, and PM_{2.5}. In addition, operation of the project would result in an air quality benefit by providing electricity generated from a renewable energy source. It is estimated the project could displace up to 130 tons of NO_x per year and 9 tons of PM₁₀ per year when compared to electricity generated from natural gas

¹ The Kern County Air Pollution Control District's name was changed in May 2010. Therefore, all references to the air district in this report are to EKACPD although the actual report or data referenced was prepared at a time when the air district was using its previous name.

combustion. Therefore, the long-term air quality benefit of the project balances the short-term air quality impact from project construction.

Construction and operation of the project would also result in emissions of greenhouse gases. One purpose of the project is to support the growing demand for renewable energy sources to meet the state's renewable energy standard (RES) of 33 percent by the year 2020. The RES is one of the measures intended to reduce statewide greenhouse gas emissions (ARB, 2008). The entire construction phase would generate approximately 5,800 metric tons of carbon dioxide (CO₂) emissions. Operation of the project would generate approximately 300 metric tons of CO₂ per year. Construction and operation of the project would result in a less than-significant impact on the environment from greenhouse gas emissions.

Operation of the project may potentially reduce statewide GHG emissions by displacing fossil-fuel-generated electricity. Assuming the project generates 762,120 MWh per year, the energy generated could displace up to 332,900 metric tons of CO₂ emissions per year when compared to electricity generated from natural gas combustion.

Introduction

1.1 Project Description

Alta Windpower Development, LLC (AWD), proposes to construct the Alta East Wind Project (project) in southeastern Kern County, California. The wind energy facility would include up to 120 wind turbine generators capable of generating up to 300 megawatts (MW) of power. The project would be located on approximately 3,200 acres on the north and south sides of State Route 58, approximately 3 miles northwest of the town of Mojave and approximately 11 miles east of the city of Tehachapi. The project location is shown in Figure 1. Two options, Option A and Option B, have been identified for the turbine layout on the project site. One turbine layout will ultimately be selected during final design and constructed. In addition, a Bridge Access Option is being considered by AWD across LADWP's aqueduct for site access. A portion of the project site would be located on privately owned land and the remainder on federal land managed by the U.S. Bureau of Land Management. Construction of the project would occur in the year 2012, with the project becoming operational by the end of 2012.

In addition to helping the nation, state, and utilities meet their renewable energy goals; the project would provide substantial economic benefits to Kern County and BLM. The project has the following goals and objectives:

- Increase the tax base of Kern County
- Provide increased revenue to BLM for the use of federal land
- Create a substantial number of temporary and permanent jobs in the county
- Boost local business activity during construction and operation
- Provide revenue to county residents who own underutilized land that has little potential to be developed for other uses while allowing these landowners to retain much of their current land use

1.2 Project Facilities

The project's permanent ancillary facilities would include service roads, a power collection system, communication cables, overhead and underground transmission lines, electrical switchyards, project substations, meteorological towers, and one operations and maintenance facility. The installed WTGs would be state-of-the-art utility multi-MW class machines and would be arranged in rows in accordance with applicable industry siting recommendations for optimum energy production and minimal land disturbance. The locations of the turbines are shown in Figures 2a and 2b.

1.3 Construction Activities

Project construction would occur in the year 2012. The anticipated schedule for construction of the project is presented in Table 1.

TABLE 1
Expected Construction Schedule

Construction Activity	Proposed Duration
Bridge Access Option	2/1/2012 – 4/30/2012
Site Preparation/Access Road Construction	5/1/2012 – 6/11/2012
Foundation Construction	5/15/2012 – 8/6/2012
Electrical System Construction	6/19/2012 – 8/27/2012
Substation/O&M Building Construction	6/26/2012 – 9/3/2012
Transmission Line Construction	6/12/2012 – 9/3/2012
WTG Construction	8/1/2012 – 12/3/2012
Site Restoration	11/20/2012 – 12/31/2012

The following sections provide additional details regarding construction activities. The assumptions used to estimate construction-related emissions are included in Section 3.2.

1.3.1 Site Preparation and Access Roads

Preparation of the project site for construction would involve land clearing and grading by removing topsoil and vegetation for roads, WTGs, and the substation. Land clearing and grading will be performed according to the Soil Erosion and Sedimentation Mitigation Plan approved by Kern County, the project's State-approved stormwater pollution prevention plan, and the grading and building permits issued by Kern County. Site activities would begin with construction of site access entryways and rough grading of access roads.

Temporary construction roads would use existing onsite roads and/or be sited in the same location as permanent roads to the extent feasible. Gravel would be used for access areas to prevent track out of mud, as well for use in mixing concrete, and would be trucked in from a local quarry. It is assumed that one temporary concrete batch plant would be located onsite to support construction activities.

1.3.2 Foundation Construction

Foundations would be required for each WTG and pad transformer and the collector substation. When the roads are completed for a particular group of WTGs, construction of the foundations for these WTGs would commence. Each WTG will have a concrete and steel reinforced foundation. Foundation construction would include the following stages: drilling, blasting (if required), and hole excavation; outer form setting; rebar and bolt cage assembly; concrete casting and finishing; removal of the forms; backfilling and compaction; construction of the transformer foundation pad; and foundation site area restoration.

Excavation and foundation construction would be conducted in a manner that would minimize the size and duration of excavated areas required to install foundations.

1.3.3 Electrical System Construction

After the roads, WTG foundations, and transformer pads are completed for a particular row of WTGs, underground cables will be installed along that road section. Trenches will be cut to the required depth. Cables will be laid in the trenches, surrounded with a cushion of clean fill, inspected, and the trenches backfilled. Shallower trenches might be required where solid rock is encountered. Cables will be protected with concrete slurry. The 34.5 kV cables would be connected to the WTG pad-mounted transformers, and low-voltage wiring between the transformers and the bus cabinet inside the WTG towers would be completed, inspected, and tested.

1.3.4 Wind Turbine Generator Construction

For each WTG, the turbine pad will be constructed of compacted soil graded to draw stormwater runoff away from the foundations. The construction process can be described as follows:

- The site is graded to the desired elevation and the foundation hole excavated.
- Forms are set in place and steel reinforcement and anchor bolts are placed into the foundation hole.
- The foundation is poured, allowed to cure, and ground control grids are installed.
- The tower sections are raised into place using a crane and then bolted together.
- A crane is used to raise the nacelle to its place atop the tower, where it is bolted into place.
- The blades are attached to the hub on the ground and then the rotor assembly is hoisted into place on the front of the nacelle and bolted into place (in some cases – for large turbines – a single blade installation may be required by attaching the blades to the hub after the hub is attached to the nacelle atop the tower).
- All internal cabling is connected and terminated.

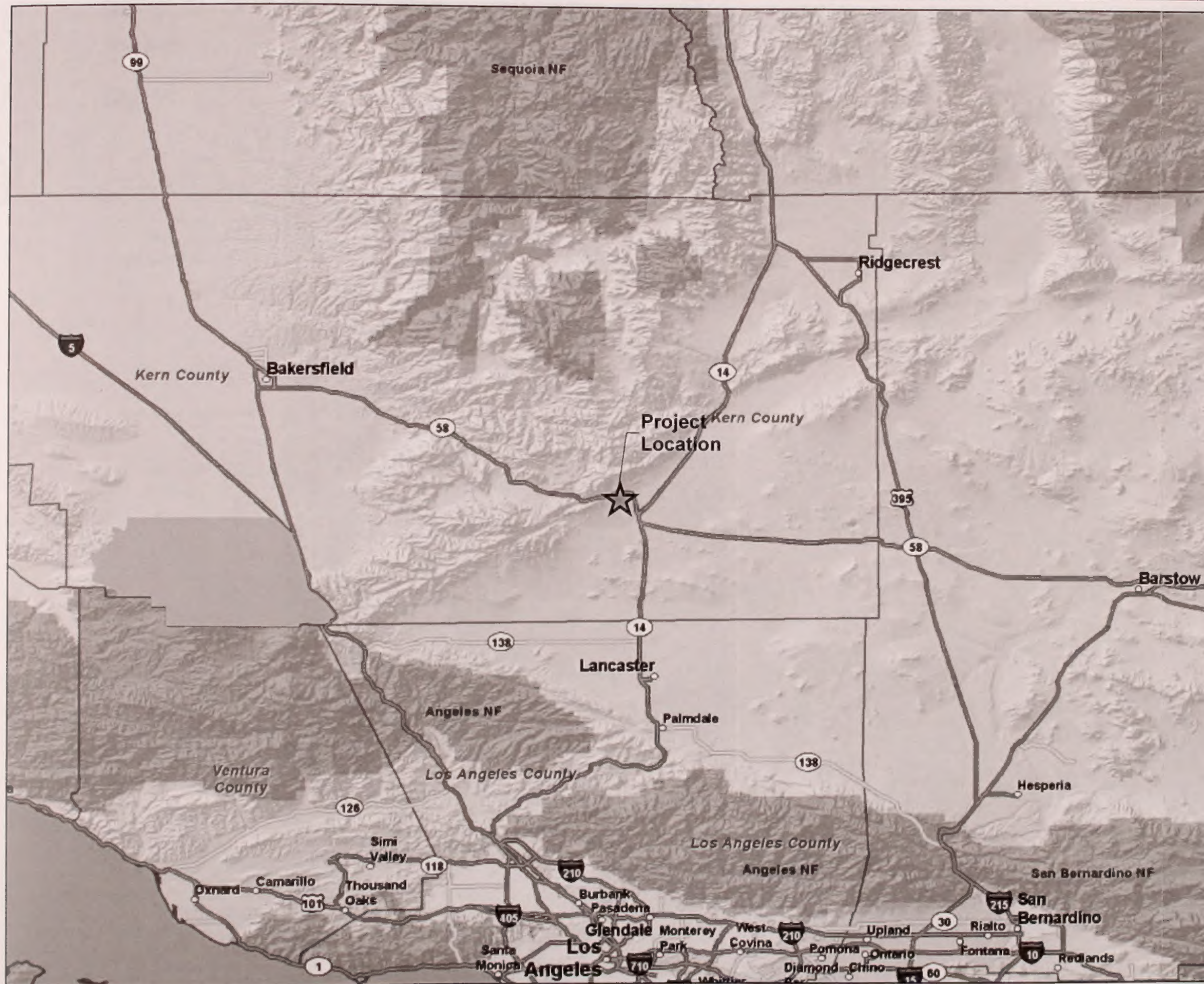
Following completion of commissioning, the turbine pads will be finish graded to repair any construction damage and to assure proper drainage of storm water away from the foundation.

1.3.5 Site Stabilization and Restoration

After construction, preconstruction land contours at the project site would be restored to the extent feasible. All areas of temporary disturbance would be reseeded with a seed mixture appropriate to the project site in accordance with Kern County or other regulatory agencies. All construction debris and waste would be removed from the site and disposed of at an appropriate location.

1.4 Purpose of Report

This report evaluates the construction- and operation-related air quality impacts of the project as required by the Kern County Planning Department to support an Environmental Impact Report under the California Environmental Quality Act (CEQA) and an environmental evaluation under the National Environmental Policy Act (NEPA). The report includes a discussion of the applicable regulations and rules, existing air quality, methodologies used to estimate the potential construction and operation air quality impacts, a summary of construction and operation emission estimates, mitigation measures, cumulative impacts, and potential impacts from greenhouse gas (GHG) emissions.



LEGEND

- ★ Sun Creek Project Area

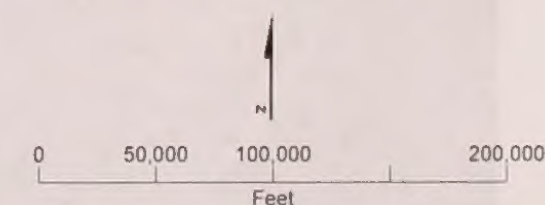
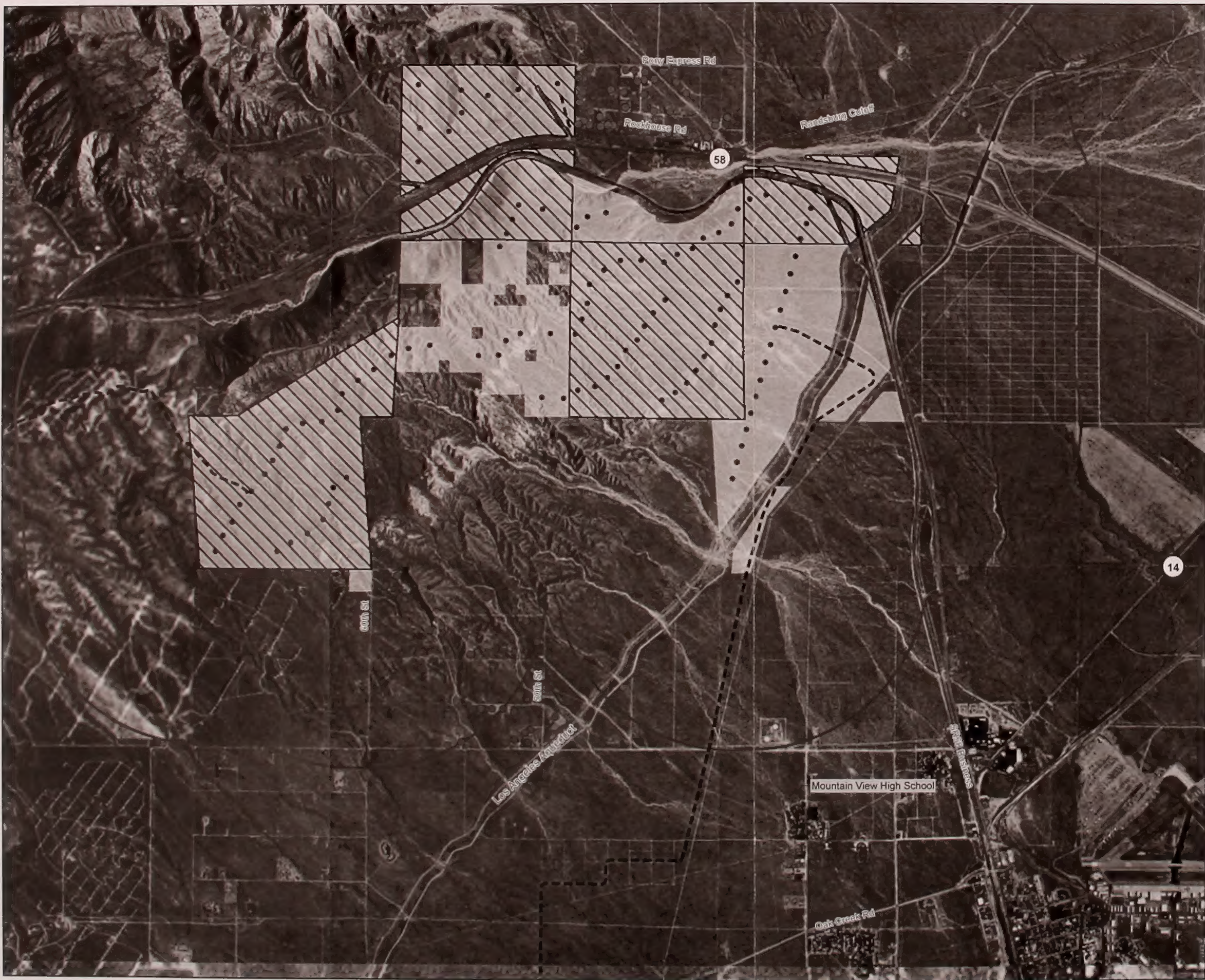


FIGURE 1
Regional Vicinity Map
 Alta East Wind Project
 Alta Wind Energy Center Project



LEGEND

- Residential Area
- Proposed Turbine Layout
- - - Access Route
- 1-Mile Project Area Radius
- ▨ BLM Lands - Multiple-Use Class L (Limited Use)
- Project Area

Note:
Turbine locations shown are approximate
and will be based upon final siting and
engineering design.

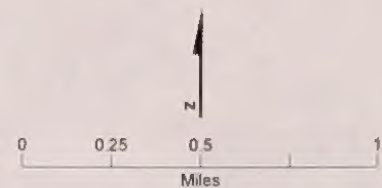
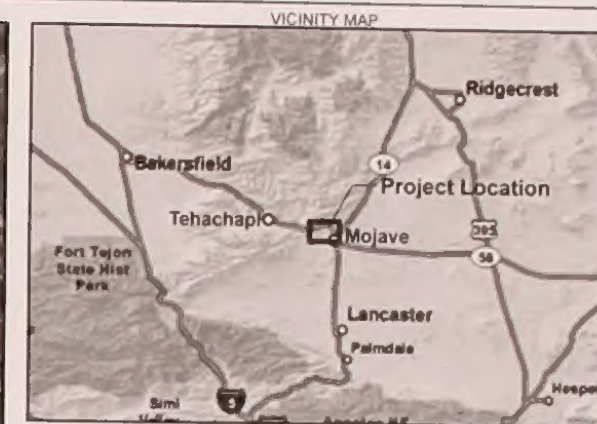
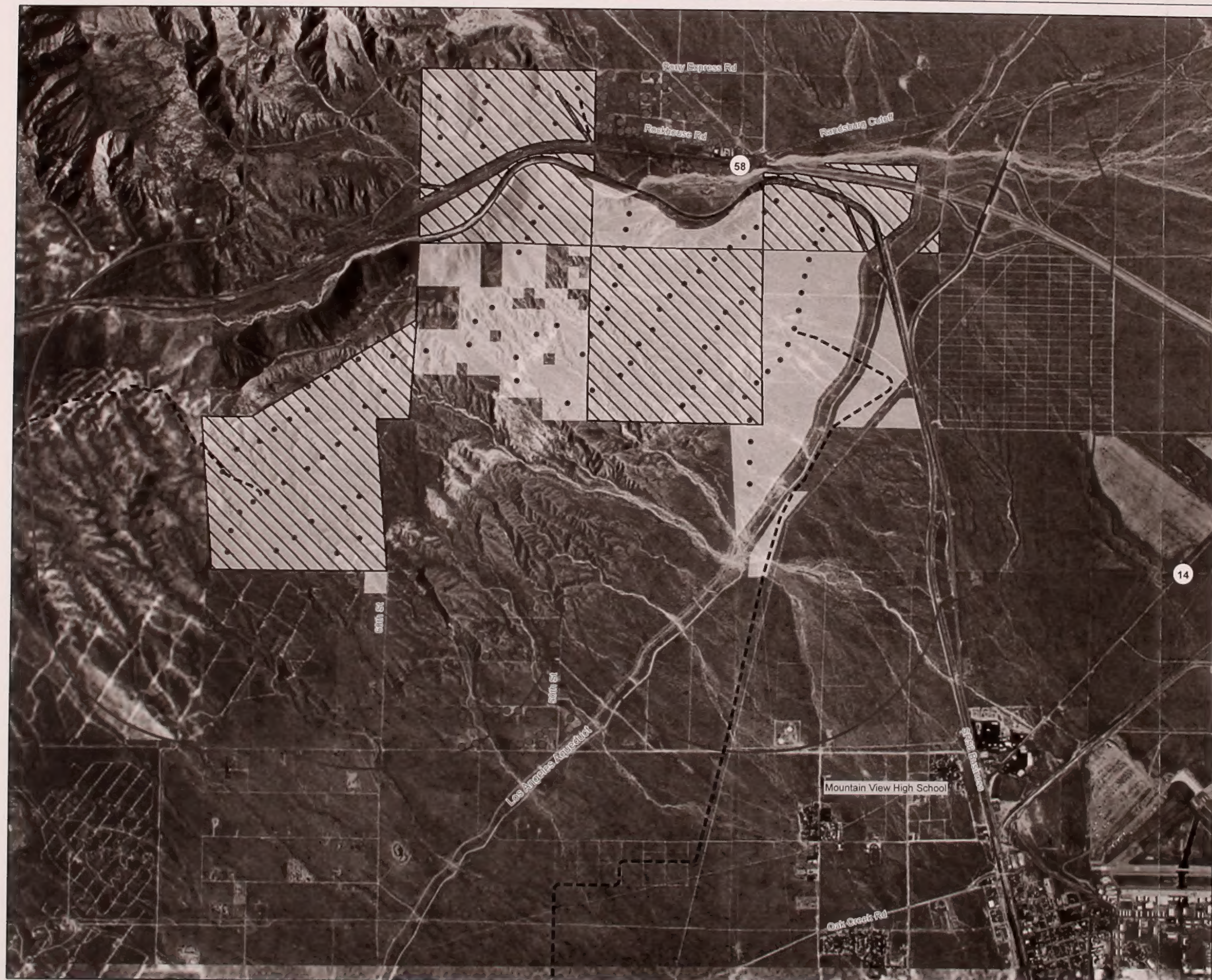


FIGURE 2a
Alta East Sensitive Receptors -
Option A
Alta East Wind Project
Alta Wind Energy Center Project



LEGEND

- Residential Area
- Proposed Turbine Layout
- - - Access Route
- 1-Mile Project Area Radius
- BLM Lands - Multiple-Use Class L (Limited Use)
- Project Area

Note:
Turbine locations shown are approximate
and will be based upon final siting and
engineering design.

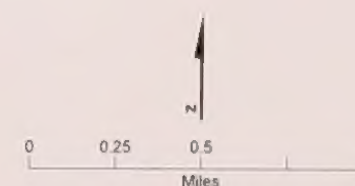


FIGURE 2b
Alta East Sensitive Receptors -
Option B
Alta East Wind Project
Alta Wind Energy Center Project

Existing Conditions

The project is located in the southeastern portion of Kern County, California, within the jurisdiction of the Eastern Kern County Air Pollution Control District (EKAPCD), which is part of the Mojave Desert Air Basin (MDAB). This section presents the regulatory and environmental setting for the project.

2.1 Regulatory Setting

The following sections summarize the federal, state, and local air quality regulations and rules.

2.1.1 Federal

2.1.1.1 Criteria Pollutants

The federal Clean Air Act (CAA) establishes the statutory framework for regulation of air quality in the United States. Pursuant to this act, the U.S. Environmental Protection Agency (EPA) has established various regulations to achieve and maintain acceptable air quality, including the adoption of National Ambient Air Quality Standards (NAAQS), mandatory state implementation plan (SIP) or maintenance plan requirements to achieve and maintain NAAQS, and emission standards for both stationary and mobile sources of air pollution. NAAQS have been established for the following air pollutants (called “criteria” pollutants): carbon monoxide (CO), ozone, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), particulate matter less than 2.5 microns in aerodynamic diameter (PM_{2.5}), and lead. NAAQS represent levels established by EPA to avoid specific adverse health and welfare effects associated with each pollutant with a margin of safety. Table 2 summarizes the ambient air quality standards.

EPA has designated counties in California as either in “attainment” or “nonattainment” for each NAAQS. A region that is meeting the air quality standard for a given pollutant is designated as being in attainment for that pollutant. If the region is not meeting the air quality standard, then it is designated as being in nonattainment for that pollutant. If a region is designated as nonattainment for a NAAQS, the federal CAA requires the state to develop a SIP to demonstrate how the standard would be attained, including the establishment of specific requirements for review and approval of new or modified stationary sources of air pollution. The eastern portion of Kern County where the project is located is designated as nonattainment for the federal ozone standard, and attainment/unclassified for the remaining criteria pollutants.

TABLE 2
Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS ^a	NAAQS ^b	
			Primary ^c	Secondary ^d
Ozone	8 hours	0.070 ppm	0.075 ppm	0.08 ppm
	1 hour	0.09 ppm	—	—
PM ₁₀	Annual arithmetic mean	20 µg/m ³	—	—
	24 hours	50 µg/m ³	150 µg/m ³	150 µg/m ³
PM _{2.5}	Annual arithmetic mean	12 µg/m ³	15 µg/m ³	15 µg/m ³
	24 hours	35 µg/m ³	35 µg/m ³	35 µg/m ³
CO	8 hours	9.0 ppm	9 ppm	—
	1 hour	20 ppm	35 ppm	—
NO ₂	Annual arithmetic mean	0.03 ppm	0.053 ppm	0.053 ppm
	1 hour	0.18 ppm	0.100 ppm	—
SO ₂	24 hours	0.04 ppm	—	—
	3 hours	—	—	0.5 ppm
	1 hour	0.25 ppm	0.075 ppm ^e	—
Lead ^f	Calendar quarter	—	1.5 µg/m ³	1.5 µg/m ³
	Rolling 3-month average	—	0.15 µg/m ³	—
	30-day average	1.5 µg/m ³	—	—
Visibility-reducing Particles	8 hours	^g	—	—
Sulfates	24 hours	25 µg/m ³	—	—
Hydrogen Sulfide	1 hour	0.03 ppm	—	—
Vinyl Chloride ^e	24 hours	0.01 ppm	—	—

^aCalifornia standards for ozone, CO (except Lake Tahoe), SO₂ (1 hour and 24 hours), NO₂, and suspended particulate matter (PM₁₀, PM_{2.5}, and visibility-reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded.

^bNational standards other than ozone, particulate matter, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, is equal to or less than the standard.

^cNational Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

^dNational Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

^eFinal rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 parts per billion.

^fCalifornia Air Resources Board (ARB) has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. ARB made this determination following the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

^gIn sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Source: ARB 2010a.

Notes:

CAAQS = California Ambient Air Quality Standards

ppm = parts per million

µg/m³ = micrograms per cubic meter

Under the 1990 CAA amendments, EPA has issued two types of SIP conformity guidelines: transportation conformity rules that apply to transportation plans and projects, and general conformity rules that apply to all other federal actions. Under transportation conformity, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that do not conform to the CAA requirements. Under general conformity, EPA requires all federal agencies to ensure that all federal actions must conform to an approved or promulgated state or federal implementation plan if the actions result in criteria pollutant emissions for which the area has been designated as a nonattainment or maintenance area. Because the project site is located primarily on federal land managed by BLM, the project may trigger a federal action and a general conformity applicability analysis would be required.

2.1.1.2 Greenhouse Gases

The EPA Mandatory Reporting GHG Rule became effective on December 29, 2009, and sources required to report were to begin collecting data on January 1, 2010. In general, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of carbon dioxide equivalent (CO₂e)² emissions are required to submit annual reports to EPA. On June 28, 2010, reporting requirements for additional source categories (for example, industrial wastewater treatment) were finalized. Operation of the project would not generate GHG emissions in an amount that would require reporting.

In addition, the Supreme Court decision in *Massachusetts et al. v. Environmental Protection Agency et al.* (Supreme Court Case 05-1120) found that EPA has the authority to list GHGs as pollutants and to regulate emissions of GHGs under the federal CAA. On April 17, 2009, EPA found that CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride may contribute to air pollution and may endanger public health and welfare.

On May 13, 2010, the EPA issued a final rule that established addressing GHG emissions from stationary sources under the CAA permitting programs. The final rule sets thresholds for GHG emissions that define when stationary source permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This rule would not be applicable to the project because GHG emissions from the emergency generators would not be subject to the federal permitting programs under the CAA.

2.1.2 State

2.1.2.1 Criteria Pollutants and Toxic Air Contaminants

The California Air Resources Board (ARB) is the state agency responsible for California air quality management, including establishment of ambient air quality standards, mobile source emission standards, GHG regulations, oversight of local air quality districts and preparation of implementation plans, including regulations for stationary sources of air pollution. California established state ambient air quality standards (CAAQS) in 1969. The

² CO₂e is measure used to compare the emissions from various greenhouse gases (for example, CH₄) based on the pollutant's global warming potential.

California Clean Air Act (CCAA) was approved in 1988 and requires each local air district in the state to prepare an air quality plan to achieve compliance with the CAAQS. The CAAQS are generally more stringent (except for 1-hour average NO₂ and SO₂) and include more pollutants than the NAAQS. Similar to EPA, ARB designates counties in California as in attainment or nonattainment for CAAQS. The eastern portion of Kern County is designated as nonattainment for the state ozone and PM₁₀ standards, and attainment/unclassified for the remaining criteria pollutants.

In addition to the ambient air quality standards for criteria pollutants, the California Toxic Air Contaminant Identification and Control Act, established in 1983, created a two-step process to identify toxic air contaminants (TAC) and control their emissions. ARB assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a TAC. The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588) was enacted in September 1987. The act requires that toxic air emissions from stationary sources be quantified and compiled into an inventory and that the public be notified of significant risks posed by nearby facilities. The project does not include stationary sources subject to AB 2588 requirements.

2.1.2.2 Greenhouse Gases

In 2006, the California State Legislature signed the Global Warming Solutions Act of 2006 (AB 32), which provides the framework for regulating GHG emissions in California. This law requires ARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit is 427 million metric tons CO₂e (ARB, 2007). CO₂ emissions account for approximately 90 percent of the statewide GHG emissions.³ Methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride emissions account for the remainder of the statewide GHG emissions.

Part of ARB's direction under AB 32 was to develop a scoping plan that contains the main strategies California will use to reduce GHG emissions that cause climate change. The scoping plan includes a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program (ARB, 2008). The first regulation adopted by ARB pursuant to AB 32 was the regulation requiring mandatory reporting of GHG emissions. The regulation requires large industrial sources emitting more than 25,000 metric tons of CO₂ per year to report and verify their GHG emissions from combustion of both fossil fuels and biomass-derived fuels. The California cap-and-trade program is being developed, a draft resolution was approved by ARB on December 16, 2010, and the final resolution is expected in 2011. Governor Schwarzenegger directed the ARB, pursuant to Executive Order S-21-09, to adopt a regulation, requiring the state's load-serving entities to meet a 33 percent renewable energy target by 2020. The renewable electricity standard (RES) resolution was

³ See note 2.

approved by ARB in September 2010. Finally, in February 2011, the ARB approved the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear which applies to owners of gas insulated switchgear such as circuit breakers and transformers.

2.1.3 Local

2.1.3.1 Eastern Kern Air Pollution Control District (EKAPCD)

The project is located within the local jurisdictional boundaries of EKAPCD. EKAPCD implements air quality programs required by state and federal mandates, enforces rules and regulations based on air pollution laws, and educates business owners and residents about their role in protecting air quality. EKAPCD is the local agency charged with preparing, adopting, and implementing stationary and area air emission control measures and standards. Under the California CAA, EKAPCD is required to develop an air quality plan for nonattainment criteria pollutants within the air district.

EKAPCD established the following rules, which may be applicable to the project, to ensure compliance with state and federal regulations:

Rule 201. Permits Required. Rule 201 establishes permitting requirements for stationary sources. Construction and operation of the project would not include operation of stationary sources subject to EKAPCD permitting requirements. During construction, temporary concrete batch plants are assumed to be registered through the ARB portable equipment registration program and would be exempt from EKAPCD permitting (Rule 202) or would have the required permits from EKAPCD. It is assumed that these permits would be the responsibility of the construction contractor. For operation, two propane emergency generators would be located onsite. The generators would be permitted in compliance with EKAPCD permitting rules prior to operation.

Rule 210.1. Standards for Permits to Operate. Rule 210.1 establishes stationary source offset levels for new and modified stationary sources of air pollutants. The generators installed at the substation and control building would comply with EKAPCD permitting rules.

Rule 401. Visible Emissions. Rule 401 limits the discharge of any contaminant into the atmosphere from a single source that reduces visibility beyond the limits in the rule.

Rule 402. Fugitive Dust. Rule 402 reduces the amount of fugitive PM₁₀ emissions from significant man-made dust sources. Rule 402 applies to specified bulk storage, earthmoving, construction and demolition, and man-made conditions resulting in wind erosion. The project meets the rule's definition of a large operation, defined as "any active operation, including vehicle movement on unpaved roadways, on property involving in excess of 100 contiguous acres of disturbed surface area, or any earth-moving activity exceeding a daily volume of 7,700 cubic meters (10,000 cubic yards) three times during the most recent 365-day period." Therefore, as discussed in Section 5, Mitigation measures, the project must prepare and implement a fugitive dust emissions control plan.

Rule 404.1. Particulate Matter Concentration. Rule 404.1 applies to any person who discharges particulate matter emissions into the atmosphere from any single source operation.

Rule 419. Nuisance. Rule 419 states that a person shall not discharge from any source whatsoever such quantities of contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or that endanger the comfort, repose, health, or safety of such persons or the public or that cause or have a natural tendency to cause injury or damage to business or property.

Ozone Attainment Plan

EKAPCD first prepared an ozone attainment plan in 1992 to address the 1-hour federal standard that has been revoked. The 2005 Implementation Progress Report (EKAPD, 2005) states that ARB staff recognize EKAPCD as a nonurbanized, moderate ozone nonattainment district overwhelmingly impacted by upwind transport. Therefore, the focus of the attainment plan is to reduce emissions of ozone precursors (oxides of nitrogen [NO_x] and reactive organic gas [ROG]) through EKAPCD rules. The rules focus on stationary sources of emissions such as storage of organic liquids or boilers.

2.1.3.2 Kern County

Kern County also contributes to improving air quality through land use planning documents such as the Kern County General Plan (KCGP)(Kern County, 2007). The KCGP Land Use, Conservation, and Open Space Element chapter includes a section on air quality policies and implementation measures. The following policies and implementation measures from the KCGP are relevant to the project:

Policy 18. The air quality implications of new discretionary land use proposals shall be considered in approval of major developments. Special emphasis will be placed on minimizing air quality degradation in the desert to enable effective military operations and in the valley region to meet attainment goals.

Policy 19. In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision making body, as part of its deliberations, will ensure that:

- (a) All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and
- (b) The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.

Policy 20. The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.

Policy 21. The County shall support air districts' efforts to reduce PM₁₀ and PM_{2.5} emissions.

Policy 22. Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, state, and local standards.

Policy 23. The County shall continue to implement the local government control measures in coordination with the Kern Council of Governments and the San Joaquin Valley Unified Air Pollution Control District.

Implementation Measures

Measure F. All discretionary permits shall be referred to the appropriate air district for review and comment.

Measure G. Discretionary development projects involving the use of tractor-trailer rigs shall incorporate diesel exhaust reduction strategies including, but not limited to:

- a. Minimizing idling time.
- b. Electrical overnight plug-ins.

Measure H. Discretionary projects may use one or more of the following to reduce air quality effects:

- a. Pave dirt roads within the development.
- b. Pave outside storage areas.
- c. Provide additional low Volatile Organic Compounds (VOC) producing trees on landscape plans.
- d. Use of alternative fuel fleet vehicles or hybrid vehicles.
- e. Use of emission control devices on diesel equipment.
- f. Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency certified, low emission natural gas fireplaces.
- g. Provide bicycle lockers and shower facilities on site.
- h. Increasing the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86).
- i. The use and development of park and ride facilities in outlying areas.
- j. Other strategies that may be recommended by the local Air Pollution Control Districts.

Measure J. The County should include PM₁₀ control measures as conditions of approval for subdivision maps, site plans, and grading permits.

Kern County Zoning Ordinance. The Wind Energy (WE) Combining District (Chapter 19.64) contains development standards and conditions (Section 19.64.140) that would be applicable to the siting and operation of WTGs. The following provisions apply to air quality issues related to the project:

- Section 19.64.140(H): All wind projects including wind generators and towers shall comply with all applicable county, state, and federal laws, ordinances, or regulations.

A portion of the project is also located within the area covered by the Mojave Specific Plan. The Mojave Specific Plan guides development within and surrounding the Mojave community for the next 20 to 40 years (Kern County, 2003). The following policies and implementation measures from the Mojave Specific Plan are relevant to the project:

Objective 4.6: Promote the improvement of air quality and the maintenance of State and federal air quality standards in the Mojave area.

- Policy 4.6.1 Cooperate with the Kern County Air Pollution Control District to implement the Air Quality Attainment Plan.
- Policy 4.6.2 Continue to enforce the Kern County grading ordinance through Engineering and Survey Services (ESS), along with dust control and other rules and measures through the Air Pollution Control District to mitigate air quality effects during the construction of new development.
- Policy 4.6.3 Encourage development designs that promote energy conservation and that minimize the direct and indirect emissions of air contaminants.

Implementation Measures

N-2. Review air quality impacts from new developments in the Specific Plan area:

- a) Evaluate proposals for discretionary projects to ensure that the project complies with air quality standards.
- b) Air Quality studies will be required for industrial zone changes and conditional use permit projects which may emit affected pollutants, or toxic air contaminants. Prior to the approval of any industrial zone changes and/or conditional use permits, a level of impact determination shall be made, at which time the appropriate air quality analysis will be conducted.
- c) The following measures shall be incorporated into all development projects, as applicable (only the items applicable to the project were included below). Verification of these measures shall occur during development review and building inspection:
 - 1) Review for commercial and industrial development involving heavy duty truck usage shall review and verify the parking lot circulation for reduced vehicle queuing. This review will include consideration of entrance/exit driveways and ease of turning movements, as well as whether a proposed warehousing or industrial use contains parking spaces for heavy duty trucks to layover overnight.
 - 2) The applicant for development of commercial and industrial development involving heavy duty truck usage shall limit engine idling times to no more than 10 minutes at the project site by posting signs instructing drivers to turn off engines as they park at loading/unloading docks. Overnight truck parking areas shall be no idling zones and shall be equipped with plug-in power supplies.

- d) The EKAPCD maintains Permit to Operate requirements that direct owners/operators of certain types of stationary equipment to obtain an Authority to Construct (ATC) from the District.

2.2 Environmental Setting

2.2.1 Topography and Climate

The project site is located in the western Mojave Desert, in a rural part of the Antelope Valley (Kern County), within the foothills of the Tehachapi Mountains known as the Horned Toad Hills. The site is approximately 3 miles northwest of Mojave and 11 miles east of Tehachapi, and extends both north and south of State Route 58.

The climate of the MDAB is characterized by relatively hot summers, mild winters, large diurnal ranges in temperature, irregular rainfall, low relative humidity, and abundant sunshine. The air basin is separated from the coastal regions by two mountain ranges that provide a climatological boundary and also provide a unique wind flow pattern conducive to wind energy projects. This area is known as the Tehachapi Wind Resource Area and has some of the best wind resources in California. Several wind farms already exist in this area and many more are currently undergoing the regulatory review process.

In Mojave, California, July is usually the warmest month of the year, with temperatures ranging from 70 to 98 degrees Fahrenheit (°F). The coldest month is usually December, with temperatures ranging from 33 to 57°F. Relative humidity in the Mojave Desert is typically 10 percent on summer afternoons, and 30 percent on winter afternoons. Precipitation in the vicinity of the project averages approximately 5.9 inches per year, with most of the precipitation in the winter. The climate summaries for Mojave, California, are included in Appendix A.

2.2.2 Criteria Pollutants

Ambient concentrations of the criteria pollutants ozone, NO₂, CO, SO₂, PM₁₀, and PM_{2.5} are recorded at monitoring stations located throughout the MDAB. Ambient air quality data are published by ARB and EPA, on the Aerometric Data Analysis and Management System (ADAM) and AirData websites, respectively. The nearest ARB monitoring station to the project site, the Mojave station, was used to establish the existing air quality for the project. However, CO and NO₂ concentrations are not monitored at this station. Therefore, the Lancaster station was used to supplement the Mojave station data. Table 3 presents the maximum pollutant levels measured over the past 4 years.

TABLE 3
Summary of Maximum Ambient Air Monitoring Data

Pollutant	Averaging Time	Federal Attainment Status	State Attainment Status	2006	2007	2008
Ozone (ppm)	1 Hour	Nonattainment ^a	Nonattainment	0.109	0.092	0.112
	8 Hour			0.102	0.085	0.103
Nitrogen Dioxide (ppm)	Annual Arithmetic Mean	Attainment	Attainment	0.015	0.015	0.013
	1 Hour			0.066	0.064	0.062
Carbon Monoxide (ppm)	1 Hour	Unclassified/Attainment	Unclassified	3.2	2.5	2.2
	8 Hour			1.60	1.25	1.04
PM ₁₀ (µg/m ³)	24 Hour	Unclassified	Nonattainment	58.0	70.0	144.8
	Annual Arithmetic Mean			19.5	22	22.3
PM _{2.5} (µg/m ³)	24 Hour	Unclassified/Attainment	Unclassified	21.3	21.1	19.1
	Annual Arithmetic Mean			5.4	6.2	7.5

Notes:

^a Nonattainment status applies to the 8-hour ozone standard, the federal 1-hour ozone standard was revoked in 2005.

^b Insufficient (or no data) data to determine value.

Hydrogen sulfide, vinyl chloride, and visibility-reducing particles are not monitored in the MDAB.
ppm = parts per million

Source: ARB 2010b.

2.2.2.1 Ozone

Ozone is a photochemical oxidant that is formed when volatile organic compounds (VOC) and NO_x react in the presence of ultraviolet sunlight. The primary sources of NO_x and VOC, often termed ozone precursors, are combustion processes (including motor vehicle engines) and evaporation of solvents, paints, and fuels. Exposure to ozone can cause eye irritation, aggravate respiratory diseases, and damage lung tissue, as well as damage vegetation and reduce visibility. Elevated ozone levels also can reduce crop and timber yields and damage native plants and materials such as rubber, fabrics, and plastics. The state 1-hour and 8-hour standards and the federal 8-hour ozone standard were exceeded in 2006 through 2009 at the Mojave station as shown in Table 3.

2.2.2.2 Nitrogen Dioxide

NO₂ is a byproduct of combustion sources such as on-road and off-road motor vehicles or stationary fuel-combustion sources. The principle form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO₂, creating a mixture of NO and NO₂ commonly called NO_x. Exposures to NO₂, along with pollutants from vehicle exhaust, are associated with respiratory symptoms, episodes of respiratory illness, and impaired lung function.

As shown in Table 3, NO₂ concentrations measured at the Lancaster station have not exceeded either the state 1-hour, state annual, or federal annual standards in the past 4 years. The EPA recently established the 1-hour NO₂ standard and has not yet released

attainment designations for the 1-hour standard. However, the EPA design values indicate that Kern County would not violate the 1-hour federal NO₂ standard (EPA, 2010a). The eastern portion of Kern County is currently designated as attainment status for the federal annual NO₂ standard by EPA and state annual and 1-hour standards by ARB.

2.2.2.3 Particulate Matter (PM₁₀ and PM_{2.5})

Particulate matter pollution consists of very small liquid and solid particles floating in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. PM₁₀ refers to particles less than or equal to 10 microns in aerodynamic diameter. PM_{2.5} refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM₁₀.

Extensive research indicates that exposures to ambient PM₁₀ and PM_{2.5} concentrations that exceed current air quality standards are associated with increased risk of hospitalization for lung- and heart-related respiratory illness, including emergency room visits for asthma. Exposure is also associated with increased risk of premature death, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses.

As shown in Table 3, PM₁₀ concentrations measured at the Mojave station have not exceeded the federal standards during the past 4 years. However, the state 24-hr PM₁₀ standard has been exceeded each year during the past 4 years and the state annual PM₁₀ standard was exceeded in 2008. During the past 4 years, PM_{2.5} concentrations measured at the Mojave station have not exceeded the federal 24-hr standard. Concentrations measured at the Lancaster station have not exceeded the annual state and federal standards for PM_{2.5}. The eastern portion of Kern County is designated by EPA as unclassified/attainment for the federal PM₁₀ standards and PM_{2.5} standards. The eastern portion of Kern County is designated as nonattainment by ARB for the state PM₁₀ standards and unclassified for the state PM_{2.5} standards.

2.2.2.4 Carbon Monoxide

CO is a colorless, odorless gas formed by incomplete combustion of fuels. Exposure to CO near the levels of the ambient air quality standards can lead to fatigue, headaches, confusion, and dizziness. As shown in Table 3, CO concentrations measured at the Lancaster station have not exceeded either the state or federal standards in the past 4 years. The eastern portion of Kern County is designated attainment status for the CO standards by both EPA and ARB.

2.2.2.5 Sulfur Dioxide

SO₂ is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Effects from SO₂ exposures at levels near the 1-hour standard include bronchio-constriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity.

The following additional state criteria pollutant descriptions are provided for informational purposes. This air quality analysis does not evaluate emissions or impacts of these pollutants from construction or operation of the project.

2.2.2.6 Sulfates

Sulfates are particulate products of combustion of sulfur containing fossil fuels. When sulfur oxide (SO) or SO₂ are exposed to oxygen it precipitates out into sulfates (SO₃ or SO₄). Data collected in Kern County identify that levels of sulfates are significantly less than the applicable health standards.

2.2.2.7 Lead

Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until the late 20th century to increase the octane rating in auto fuel. Because gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels and the use of leaded fuel has been mostly phased out, the ambient concentrations of lead have dropped dramatically. Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs.

2.2.2.8 Hydrogen Sulfide

Hydrogen sulfide is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Exposure to higher concentrations (above 100 ppm), can cause olfactory fatigue, respiratory paralysis, and death.

2.2.2.9 Visibility-reducing Particles

This standard is a measure of visibility. ARB does not yet have a measuring method with enough accuracy or precision to designate areas in the state attainment or nonattainment. The entire State is designated as unclassified.

2.2.2.10 Vinyl Chloride

Vinyl chloride monomer is a sweet-smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and polyvinyl chloride (PVC) production are the major identified sources of vinyl chloride emissions in California. PVC can be fabricated into many products such as PVC pipes, pipefittings, and plastics. In humans, epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers. There are currently no adopted ambient air standards for vinyl chloride.

2.2.3 Toxic Air Contaminants

TACs are air pollutants that may cause adverse health effects, particularly cancer or reproductive harm. The following ten TACs pose the greatest known health risk in California, based primarily on ambient air quality data: acetaldehyde; benzene;

1,3-butadiene; carbon tetrachloride; hexavalent chromium; para-dichlorobenzene; formaldehyde; methylene chloride; perchloroethylene; and diesel particulate matter (ARB, 2009). The Kern County portion of the MDAB shows the following tons per year (tpy) emissions for the following ten TACs in 2008: acetaldehyde (180 tpy); benzene (106 tpy); 1,3-butadiene (59 tpy); carbon tetrachloride (0 tpy); chromium (hexavalent) (0 tpy); para-dichlorobenzene (6 tpy); formaldehyde (476 tpy); methylene chloride (15 tpy); perchloroethylene (16 tpy); and diesel particulate matter (495 tpy)(ARB, 2009). Approximately 80 percent of the statewide acetaldehyde emissions are from mobile sources, with area sources accounting for approximately 18 percent of statewide emissions. The primary sources of benzene in the MDAB include mobile sources (87 percent) and stationary sources (12 percent). Approximately 53 percent of 1,3-butadiene emissions are from mobile sources. Most of the emissions of para-dichlorobenzene are from consumer products such as non-aerosol insect repellents and solid/gel air fresheners. Approximately 82 percent of formaldehyde emissions in the MDAB are from mobile sources, while 48 percent of methylene chloride emissions are from paint removers/strippers, automotive brake cleaners, and other consumer products. Perchloroethylene is produced primarily from stationary sources such as dry cleaning plants and manufacturing of aircraft parts and fabricated metal parts. Emissions of diesel particulate matter are from mobile sources (98 percent) and stationary sources (1 percent).

Ambient air quality standards have not been established for TACs because no safe levels can be determined. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act apply to facilities that use, produce, or emit toxic chemicals. Facilities that are subject to the toxic emission inventory requirements of the Act must prepare and submit toxic emission inventory plans and reports, and periodically update those reports. According to the EKAPCD, "no facility in the District exceeds a cancer risk of 10 in 1 million or a hazard index of 1.0" (EKAPCD, 2008). This is not considered significant under the standards of the "Hot Spots" program.

2.2.3.1 Description of TACs

The following provides descriptions of the ten TACs discussed previously. The descriptions below were taken from the Kern County *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports, Attachment C* (Kern County, 2006).

Acetaldehyde

Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere from photochemical oxidation. Sources include combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters. Acetaldehyde is classified as a federal hazardous air pollutant and as a California TAC. Acetaldehyde is a carcinogen that also causes chronic non-cancer toxicity in the respiratory system. Symptoms of chronic intoxication of acetaldehyde in humans resemble those of alcoholism. The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema, and necrosis may also occur. Acute inhalation of acetaldehyde resulted in a depressed respiratory rate and elevated blood pressure in experimental animals. Tests involving acute exposure of rats, rabbits, and

hamsters have demonstrated acetaldehyde to have low acute toxicity from inhalation and moderate acute toxicity from oral or dermal exposure.

Benzene

Approximately 84 percent of the benzene emitted in California comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Currently, the benzene content of gasoline is less than one percent. Benzene is highly carcinogenic and occurs throughout California. Benzene also has non-cancer health effects. Brief inhalation exposure to high concentrations can cause central nervous system depression. Acute effects include central nervous system symptoms of nausea, tremors, drowsiness, dizziness, headache, intoxication, and unconsciousness. Neurological symptoms of inhalation exposure to benzene include drowsiness, dizziness, headaches, and unconsciousness in humans. Ingestion of large amounts of benzene may result in vomiting, dizziness, and convulsions in humans. Exposure to liquid and vapor may irritate the skin, eyes, and upper respiratory tract in humans. Redness and blisters may result from dermal exposure to benzene. Chronic inhalation of certain levels of benzene causes disorders in the blood in humans. Benzene specifically affects bone marrow (the tissues that produce blood cells). Aplastic anemia, excessive bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans occupationally exposed to benzene.

1,3-Butadiene

The majority of 1,3-butadiene emissions come from incomplete combustion of gasoline and diesel fuels. Mobile sources account for 83 percent of total statewide emissions. Area-wide sources such as agricultural waste burning and open burning contribute approximately 13 percent of statewide emissions. 1,3-Butadiene has been identified as a carcinogen in California. Butadiene vapors cause neurological effects at very high levels such as blurred vision, fatigue, headache, and vertigo. Dermal exposure of humans to 1,3-butadiene causes a sensation of cold, followed by a burning sensation, which may lead to frostbite (ARB, 2005). One epidemiological study reported that chronic (long-term) exposure to 1,3-butadiene via inhalation resulted in an increase in cardiovascular diseases, such as rheumatic and arteriosclerotic heart diseases, while other human studies have reported effects on the blood. A large epidemiological study of synthetic rubber industry workers demonstrated a consistent association between 1,3-butadiene exposure and occurrence of leukemia. Several epidemiological studies of workers in styrenebutadiene rubber factories have shown an increased incidence of respiratory, bladder, stomach, and lymphato-hematopoietic cancers. However, these studies are not sufficient to determine a causal association between 1,3-butadiene exposure and cancer due to possible exposure to other chemicals and other confounding factors.

Carbon Tetrachloride

The primary sources of carbon tetrachloride in California include chemical and allied product manufacturers and petroleum refineries. In California, carbon tetrachloride has been identified as a carcinogen. Carbon tetrachloride is also a central nervous system depressant and mild eye and respiratory tract irritant. EPA has classified carbon tetrachloride as a probable human carcinogen. Acute inhalation and oral exposures to high levels of carbon tetrachloride have been observed primarily to damage the liver (swollen,

tender liver, changes in enzyme levels, and jaundice) and kidneys (nephritis, nephrosis, proteinurea) of humans. Depression of the central nervous system has also been reported. Symptoms of acute exposure in humans include headache, weakness, lethargy, nausea, and vomiting. Delayed pulmonary edema (fluid in lungs) has been observed in humans exposed to high levels of carbon tetrachloride by inhalation and ingestion, but this is believed to be a result of injury to the kidney rather than direct action of carbon tetrachloride on the lung. Chronic inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans and animals.

Chromium, Hexavalent

Chromium plating and other metal finishing processes are the primary sources of hexavalent chromium emissions in California. In California, hexavalent chromium has been identified as a carcinogen. There is epidemiological evidence that exposure to inhaled hexavalent chromium may result in lung cancer. The principal acute effects are renal toxicity, gastrointestinal hemorrhage, and intravascular hemolysis. The respiratory tract is the major target organ for chromium (VI) following inhalation exposure in humans. Other effects noted from acute inhalation exposure to very high concentrations of chromium (VI) include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. Chronic inhalation exposure to chromium (VI) in humans results in effects on the respiratory tract, with perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, asthma, and nasal itching and soreness reported. Chronic human exposure to high levels of chromium (VI) by inhalation or oral exposure may produce effects on the liver, kidney, gastrointestinal and immune systems, and possibly the blood.

Para-dichlorobenzene

The primary sources of para-dichlorobenzene include consumer products such as non-aerosol insect repellents and solid/gel air fresheners. These sources contribute 99 percent of statewide para-dichlorobenzene emissions. In California, para-dichlorobenzene has been identified as a carcinogen. Acute exposure to 1,4-dichlorobenzene via inhalation in humans results in irritation to the eyes, skin, and throat. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans (for example, cerebellar ataxia, dysarthria, weakness in limbs, and hyporeflexia).

Formaldehyde

Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Formaldehyde is a product of incomplete combustion. One of the primary sources of formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is used in fumigants and soil disinfectants. The major toxic effects caused by acute formaldehyde exposure via inhalation are eye, nose, and throat irritation and effects on the nasal cavity. Other effects from exposure to high levels of formaldehyde in humans include coughing, wheezing, chest pains, and bronchitis. Chronic exposure to formaldehyde by inhalation in humans has been associated with respiratory symptoms and eye, nose, and throat irritation. Animal studies have reported effects on the nasal respiratory epithelium and lesions in the respiratory system from chronic inhalation exposure to formaldehyde. Occupational studies have noted statistically significant associations between exposure to formaldehyde and increased incidence of lung and nasopharyngeal cancer. This

evidence is considered to be “limited,” rather than “sufficient,” due to possible exposure to other agents that may have contributed to the excess cancers. EPA considers formaldehyde to be a probable human carcinogen. In California, formaldehyde has been identified as a carcinogen.

Methylene Chloride

Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic manufacture, and as a solvent in paint-stripping operations. Paint removers account for the largest use of methylene chloride in California. Case studies of methylene chloride poisoning during paint-stripping operations have demonstrated that inhalation exposure to extremely high levels can be fatal to humans. Acute inhalation exposure to high levels of methylene chloride in humans has resulted in effects on the central nervous system including decreased visual, auditory, and psychomotor functions, but these effects are reversible once exposure ceases. Methylene chloride also irritates the nose and throat at high concentrations. The major effects from chronic inhalation exposure to methylene chloride in humans are effects on the central nervous system, such as headaches, dizziness, nausea, and memory loss. In addition, chronic exposure can lead to bone marrow, hepatic, and renal toxicity. EPA considers methylene chloride to be a probable human carcinogen. California considers methylene chloride to be carcinogenic.

Perchloroethylene

Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents. In California, perchloroethylene has been identified as a carcinogen. Perchloroethylene vapors are irritating to the eyes and respiratory tract. Following chronic exposure, workers have shown signs of liver toxicity, as well as kidney dysfunction, and neurological disorders.

Diesel Particulate Matter

Diesel particulate matter is emitted from both mobile and stationary sources. In California, on-road diesel-fueled engines contribute approximately 24 percent of the statewide total, with an additional 71 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources contribute about 5 percent of total diesel particulate matter. Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde and nickel) have the potential to contribute to mutations in cells that can lead to cancer. Long-term exposure to diesel exhaust particles poses the highest cancer risk of any TAC evaluated by OEHHA. ARB estimates that about 70 percent of the cancer risk that the average Californian faces from breathing toxic air pollutants stems from diesel exhaust particles. In its comprehensive assessment of diesel exhaust, OEHHA analyzed more than 30 studies of people who worked around diesel equipment, including truck drivers, railroad workers and equipment operators. The studies showed these workers were more likely to develop lung cancer than workers who were not exposed to diesel emissions. These studies provide strong evidence that long-term occupational exposure to diesel exhaust increases the risk of lung cancer. Using information from OEHHA's assessment, ARB estimates that diesel-particle levels measured in California's air in 2000 could cause 540 “excess” cancers (beyond what would occur if there were no diesel particles in the air) in a population of

1 million people over a 70-year lifetime. Other researchers and scientific organizations, including the National Institute for Occupational Safety and Health, have calculated cancer risks from diesel exhaust that are similar to those developed by OEHHA and ARB. Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. Diesel engines are a major source of fine-particle pollution. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks and premature deaths among those suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. In California, diesel exhaust particles have been identified as a carcinogen.

2.2.4 Sensitive Receptors

A sensitive receptor is a location where human populations such as children or elderly persons are located and there is reasonable expectation of continuous human exposure on the basis of the averaging period for the pollutant. Sensitive receptors are facilities such as hospitals, schools, convalescent facilities, child care centers, or residential areas. The nearest potential sensitive receptors to the project site are residential properties located approximately 0.25 mile north of the project. The nearest specific sensitive receptor is Mountain View High School located approximately 3 miles south of the project. The locations of sensitive receptors within 1 mile of the project are presented in Figures 2a and 2b.

2.2.5 Greenhouse Gases

The final category of pollutants included as part of the ambient air discussion is GHGs. GHGs include the following pollutants (EPA, 2010b):

- CO₂ is a naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes, and other industrial processes. It is the principal anthropogenic GHG that affects the Earth's radiative balance.
- Methane (CH₄) is a GHG with a global warming potential approximately 20 times that of CO₂. CH₄ is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- Nitrous oxide (N₂O) is a GHG with a global warming potential approximately 300 times that of CO₂. Major sources of N₂O include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.

- Hydrofluorocarbons (HFC) are compounds containing only hydrogen, fluorine, chlorine, and carbon. HFCs have been introduced as a replacement for the chlorofluorocarbons identified as ozone-depleting substances.
- Perfluorocarbons (PFC) are compounds containing only fluorine and carbon. Similar to HFCs, PFCs have been introduced as a replacement for chlorofluorocarbons. PFCs are also used in manufacturing and are emitted as byproducts of industrial processes. PFCs are powerful GHGs.
- Sulfur hexafluoride (SF₆) is a colorless gas soluble in alcohol and ether, and slightly soluble in water. It is a very powerful GHG used primarily in electrical transmission and distribution systems, as well as dielectrics in electronics.

Emissions of HFCs, PFCs, or SF₆ are expected to be negligible for the project. For example, there would be sealed circuit breakers that contain SF₆ and leakage from this type of equipment would be negligible. Therefore, the project impact assessment included the impacts from emissions of CO₂, CH₄, and N₂O.

2.2.6 Valley Fever

Valley fever is a fungal infection caused by *Coccidioides* organisms. It can cause fever, chest pain, and coughing, among other signs and symptoms. The *Coccidioides* species of fungi that cause valley fever are commonly found in the soil in certain areas. Inhalation of airborne spores after disturbance of soil by people or natural disasters (such as wind storms and earthquakes) exposes people (for example, construction or agricultural workers) to dust containing the spores. Mild cases of valley fever usually go away on their own. In more severe cases of valley fever, doctors prescribe antifungal medications that can treat the underlying infection.

As the name “valley fever” implies, the fungus is found only in certain regions. In the United States, valley fever is found in the desert Southwest, including California’s San Joaquin Valley and Kern County. *Coccidiomycosis* also grows in parts of Central and South America. The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline, sandy soils. An estimated 50,000 to 100,000 persons develop symptoms of valley fever each year in the United States, with 35,000 new infections per year in California alone.

Because inhalation of airborne spores is possible after soil disturbance, if the project site were underlain by soils containing the spores, construction activities could release spores and expose workers. This discussed further in Section 3 of this report.

Impact Assessment

This chapter presents the thresholds used to evaluate air quality and GHG impacts, describes the methodology used to estimate emissions, and summarizes the potential construction and operation impacts of the project.

3.1 Thresholds of Significance

Project construction and operation activities were evaluated for potential impacts to air quality and GHG emissions. The Kern County Environmental Checklist and Kern County *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* state that a project would have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan
- Violate any air quality standard as adopted for Kern County, or as established by EPA or air district or contribute substantially to an existing or projected air quality violation
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors). Specifically, implementation of the project would have a significant impact on air quality if it would exceed any of the following EKAPCD-adopted thresholds:

Construction and Operational Emission Sources:

- ROG – 25 tpy
- NO_x – 25 tpy
- PM₁₀ – 15 tpy
- Stationary sources (determined by EKAPCD rules): 25 tpy
- Expose sensitive receptors to substantial pollutant concentrations, or exceed EKAPCD health risk public notification thresholds adopted by the EKAPCD Board
- Create objectionable odors affecting a substantial number of people

The CEQA Appendix G Environmental Checklist states that a project would have a significant impact on GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment (This is addressed in Sections 3.3.1.6 and 3.3.2.6.)
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs (This is addressed in Section 4.2.)

For evaluation of impacts under NEPA, both the CEQA thresholds and the general conformity applicability analysis were used to evaluate whether the project would cause a new violation of the NAAQS.

3.2 Methodology

This section presents the methodology used to estimate emissions and perform dispersion modeling for the project. The following explains why CO hotspots, visibility modeling, odor modeling, and a health risk assessment were not conducted for the project.

Operation of the project would result in minor increases in traffic as a result of employee commutes and periodic deliveries. Kern County requires a CO hotspot analysis for projects that would include a roadway or intersection identified as Level of Service (LOS) E or worse (Kern County, 2006). LOS is a measure of operating conditions for a roadway or intersection and is represented by categories LOS A (free flowing traffic) through LOS F (worst case traffic flow). LOS E is a category for a roadway with congested, unstable traffic flow or an intersection with significant delays (Caltrans, 2010). The project would not result in degrading nearby intersections to LOS E or worse or alter existing intersection operations. Therefore, CO hotspots were not evaluated.

Operation of the project would not create visibility impacts from dust or emissions, such as might be created from a mining project. Onsite emissions from project operation would result from maintenance vehicles; therefore, visibility impacts were not evaluated.

The project is not the type of source that would be expected to create odors such as a dairy, wastewater treatment plant, or solid waste facility. Operation of the project would not create odors. Therefore, concentrations of odorous compounds were not evaluated.

Finally, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities (BAAQMD, 2010). This results in difficulties with producing accurate estimates of health risk from construction (EPA, 2010b). The duration of project construction would be less than 1 year. Therefore, a health risk assessment was not conducted for project construction because of the short construction period, the distance to the nearest receptors (over 1,000 feet), and the variability of the location of the emission sources (diesel-fueled construction equipment). Project operation would generate minor onsite emissions from mobile sources conducting maintenance activities. The project would not include permanent, stationary sources of emissions. Therefore, a health risk assessment was not conducted for operation of the project.

3.2.1 Emission Calculation Methodology

This section presents the methodology used to estimate project-related construction and operation emissions. Construction and operational emissions from the project were categorized as onsite or offsite emissions. Onsite emissions would occur within the project boundaries (see Figures 2a and 2b). For example, construction equipment used to install the WTGs would result in onsite emissions. Conversely, offsite emissions would occur outside the project boundaries, such as, emissions from worker vehicles traveling to the project site would result in offsite emissions. Emissions were estimated for both Option A and Option B, however, the only difference between the two options would be the temporary acres disturbed. For Option A, approximately 417 acres would be disturbed and for Option B, approximately 439 acres would be disturbed. It was assumed construction of Option A and Option B would have the same schedule and number of equipment and vehicles.

Additionally, the project would include best management practices (BMP) to reduce emissions during construction. The following emission reductions were included in the unmitigated construction emissions to account for implementation of BMPs:

- Off-road construction equipment would be equipped with engines meeting the ARB Tier 3 emission standards. This would reduce NO_x emissions calculated using URBEMIS2007 by 40 percent (SCAQMD, 2010).
- Dust would be suppressed with daily watering, therefore, particulate matter emissions from disturbed areas were estimated using the average emission factor in URBEMIS2007 which would reduce emissions by 50 percent compared to the default emission factor. Fugitive dust emissions from travel on unpaved roads were reduced by 61 percent to account for watering three times daily (Rimpo and Associates, 2007).

In addition to the specific emission-reduction measures listed previously, the fugitive dust control measures identified in the BLM *Wind Energy Programmatic Environmental Impact Statement* (BLM PEIS)(BLM, 2005) would also be implemented. These measures are described in Section 5.

3.2.1.1 Construction Emissions

Short-term emissions of NO_x, ROG, CO, SO_x, PM₁₀, PM_{2.5}, and CO₂ would be generated from project construction. Construction activities include site preparation and road construction, foundation construction, WTG installation, electrical system collection system construction, transmission line construction, and substation construction. In addition, a Bridge Access Option is under consideration by AWD. The bridge construction would occur before construction of the wind facility. Construction is expected to occur over a 9 to 12-month period in the year 2012. Onsite and offsite construction emissions were divided into three categories: vehicle and construction equipment exhaust, fugitive dust generated by vehicles and construction equipment, and fugitive dust generated from the concrete batch plant.

Construction Exhaust Emissions

Construction equipment exhaust emissions of NO_x, ROG, CO, SO_x, PM₁₀, PM_{2.5}, and CO₂ were estimated using URBEMIS2007 (version 9.2.4). The construction equipment exhaust emissions were considered onsite emission sources. Emissions were estimated using the URBEMIS2007 default equipment usage rate of eight hours per day, six days per week. As discussed previously, it was assumed that the construction equipment fleet would meet the Tier 3 emission standards as a project BMP. A review of the emission factors in URBEMIS2007 found that the emission factors are on average similar to the Tier 2 emissions standards. Therefore, to represent implementation of the BMP, the unmitigated equipment NO_x emissions in URBEMIS2007 were reduced by 40 percent to account for the reduction in NO_x emissions between a Tier 2 and Tier 3 engine (EPA, 2010b). The detailed construction equipment types, hours of operation, and URBEMIS2007 output files are included in Appendix B.

The URBEMIS2007 worker trip and diesel truck default assumptions were not included in the URBEMIS2007 emission calculations. Project-specific worker and truck information were used to estimate emissions because the URBEMIS2007 default values would not be applicable to this project. Vehicle exhaust emissions were estimated in a separate spreadsheet using EMFAC2007 (version 2.3) emission factors. Gasoline work truck trips,

flatbed truck trips, and the haul truck trips with distances less than 20 miles per trip were considered onsite emission sources. Construction worker trips, delivery truck trips, and water delivery trucks with distances greater than 20 miles were considered offsite emission sources. It was assumed there would be an average of 80 construction workers per day for the duration of construction. The vehicle emission spreadsheet is included in Appendix B.

For GHG emissions, the URBEMIS2007 model estimates emissions of CO₂ but does not estimate CH₄, N₂O, or CO₂e emissions. Emissions of CH₄ and N₂O from combustion sources would be much lower than emissions of CO₂, contributing in the range of 2 to 4 percent of the CO₂e emissions (EPA, 2005). Therefore, to account for the contribution of CH₄ and N₂O emissions to CO₂e emissions, the CO₂ emissions were conservatively increased by 5 percent to report the CO₂e emissions generated from construction (EPA, 2005).

Construction Fugitive Dust Emissions from Vehicles and Equipment

Fugitive dust would result from vehicle travel on unpaved and paved roads and soil-disturbing activities, such as grading. Fugitive dust from unpaved road travel and soil-disturbing activities would occur onsite while fugitive dust from vehicle travel on paved roads would occur offsite. Gasoline work trucks, flatbed trucks, and the haul trucks traveling distances less than 20 miles were considered onsite emission sources of fugitive dust resulting from travel on unpaved roads. The construction workers and haul trucks traveling distances greater than 20 miles were considered offsite emission sources of fugitive dust resulting from travel on paved roads.

Fugitive dust emissions from vehicle travel on unpaved and paved roads were estimated using EPA-approved emission factors and methodology published in AP-42 (EPA, 2006). As discussed previously, it was assumed that unpaved roads would be watered three times daily as a project BMP. Therefore, the unmitigated unpaved road emissions were reduced by 61 percent, the control efficiency used in the URBEMIS2007 model, for watering three times daily. Implementation of mitigation measure AQ-2 (discussed in Section 5) was assumed to reduce emissions by an additional 44 percent (Rimpo and Associates, 2007). The fugitive dust emission calculations are included in Appendix B.

Fugitive dust emissions from soil disturbance (for example, grading activities) were estimated based on the average emission factor in URBEMIS2007. As discussed previously, it was assumed that areas with soil disturbance would be watered daily as a project BMP. Therefore, using the average emission factor for disturbed areas would reduce emissions by 50 percent when compared to the default disturbed area emission factor in URBEMIS2007. Implementation of mitigation measure AQ-2 (discussed in Section 5) was assumed to reduce emissions by an additional 5 percent. The fugitive dust emission calculations are included in Appendix B.

Construction Fugitive Dust Emissions from Concrete Batch Plant Operations

Fugitive dust emissions from concrete batch plant operations were estimated using EPA-approved emission factors published in AP-42. It was assumed the batch plant would operate for an 80-day period at a rate of approximately 1,000 cubic yards per day. The fugitive dust emission calculations are included in Appendix B.

3.2.1.2 Operation Emissions

Long-term emissions of NO_x, ROG, CO, SO_x, PM₁₀, PM_{2.5}, and CO₂ would be generated from project operation. Project operation emissions would be generated from routine maintenance activities, truck deliveries, worker commute trips, and emergency use of a portable propane generator. Onsite and offsite operation emissions were divided into three categories: vehicle exhaust, stationary source exhaust, and fugitive dust generated by vehicles.

Vehicle Exhaust Emissions

Vehicle exhaust emissions of NO_x, ROG, CO, SO_x, PM₁₀, PM_{2.5}, and CO₂ were estimated using EMFAC2007 (version 2.3) emission factors. Trucks used for routine maintenance activities were considered onsite emission sources and the truck deliveries and worker commutes were considered offsite emission sources. It was assumed that maintenance trucks would be used 365 days per year and would travel 20 miles per day onsite; 260 truck deliveries per year would travel a distance of 150 miles roundtrip; and 15 onsite employees would commute a distance of 50 miles roundtrip, 365 days per year. The truck deliveries would be a combination of both diesel- and gasoline-fueled trucks so it was assumed that half of the trucks would be diesel-fueled and half would be gasoline-fueled. The vehicle exhaust emission calculations are included in Appendix B.

Equipment such as cranes, forklifts, or graders would be used periodically during operation. Exhaust emissions for this equipment were estimated using the default horsepower, load factors, and emission factors from URBEMIS2007 (version 9.2.4). The exhaust emission calculations are included in Appendix B.

Similar to the methodology construction emissions, to account for the contribution of CH₄ and N₂O emissions to CO₂e emissions, the CO₂ emissions were conservatively increased by 5 percent to report the CO₂e emissions generated from construction (EPA, 2005).

Stationary Source Exhaust Emissions

Operation of the project is anticipated to require two emergency generators which will be permitted through EKAPCD. The emergency generators would be propane-fueled and limited to 200 hours per year of operation. Annual emissions were estimated based on permitted emission limits for emergency generators similar to the generators anticipated for the project. The emergency generator emission calculations are included in Appendix B.

Operation Fugitive Dust from Vehicles

Fugitive dust would result from vehicle travel on unpaved and paved roads. Fugitive dust from unpaved road travel would occur onsite, while fugitive dust from vehicle travel on paved roads would occur offsite. The maintenance trucks were considered onsite emission sources of fugitive dust resulting from travel on unpaved roads. The delivery trucks and workers were considered offsite emission sources of fugitive dust resulting from travel on paved roads. The mileages described previously for exhaust emissions were also used to estimate unpaved and paved road emissions. Fugitive dust emissions from vehicle travel on unpaved and paved roads were estimated using EPA-approved emission factors and methodology published in AP-42 (EPA, 2006). It was assumed that the unpaved roads would be watered three times daily for the control measure in the URBEMIS2007 model. Therefore, the unmitigated unpaved road emissions were reduced by 61 percent. Mitigated unpaved road emissions include a reduction of 44 percent due to limiting vehicle speeds to

15 miles per hour on unpaved roads (Rimpo and Associates, 2007). The unpaved and paved road emission calculations are included in Appendix B.

3.2.1.3 General Conformity

The project is located in a federal nonattainment area for ozone and would require federal action. Therefore, general conformity applicability was evaluated for emissions of ozone precursors, NO_x and ROG, from construction and operation of the project as there may be overlap of these phases in the year 2012. The general conformity applicability analysis is included in Appendix C.

3.2.2 Dispersion Modeling Methodology

Dispersion modeling was conducted to assess the potential 24-hour PM₁₀ and PM_{2.5} concentrations from construction of the project, in accordance with Kern County's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports*. Emissions were modeled using the AERMOD dispersion modeling program (version 09292). The AERMOD model is a steady-state, multiple-source, dispersion model that incorporates hourly meteorological data inputs and local surface characteristics. The AERMOD model was run using regulatory default control options and rural dispersion mode.

Receptor and source base elevations were determined from U.S. Geological Survey National Elevation Dataset (NED) data using the 1 arc second format. All coordinates were referenced to UTM North American Datum 1983 (NAD83), Zone 11.

Cartesian coordinate receptor grids were used, along with discrete receptors representing nearby residences, to assess the potential 24-hour ground-level PM₁₀ and PM_{2.5} concentrations. Fenceline receptors were spaced at 100-meter intervals. Receptors beyond the fenceline were spaced at 500-meter intervals out to 2.5 km.

Meteorological data for the modeling analysis was processed using AERMET. Surface meteorological data and upper air sounding data was obtained from the San Joaquin Valley Air Pollution Control District's Bakersfield station. This approach is consistent with the modeling that was conducted for the Alta-Oak Creek Mojave Project (WZI, Inc., 2009).

A copy of the AERMOD modeling output summary files are included in Appendix D.

3.3 Impact Assessment Results

This section presents the assessment of potential short-term construction impacts and long-term operation impacts of the project. The discussion of the thresholds of significance addressing consistency with plans and cumulative impacts are discussed in Section 4.

3.3.1 Construction Impacts

Temporary impacts from construction were evaluated for the pollutants NO_x, ROG, CO, SO₂, PM₁₀, PM_{2.5}, and CO₂. The project would include BMPs to reduce emissions during construction. The following emission reductions were included in the unmitigated construction emissions to account for implementation of BMPs:

- The off-road construction equipment would be equipped with engines meeting the ARB Tier 3 emission standards for NO_x which would reduce unmitigated NO_x emissions calculated using URBEMIS2007 by 40 percent (SCAQMD, 2010).
- Dust would be suppressed with daily watering, therefore, particulate matter emissions from disturbed areas were estimated using the average emission factor in URBEMIS2007 which would reduce emissions by 50 percent compared to the default emission factor. Fugitive dust emissions from travel on unpaved roads were reduced by 61 percent to account for watering three times daily (Rimpo and Associates, 2007).

The following sections summarize the potential impacts from project construction.

3.3.1.1 Construction Emissions

Temporary impacts from construction were evaluated for the pollutants NO_x, ROG, CO, SO₂, PM₁₀, and PM_{2.5}. The estimated unmitigated construction emissions are presented in Table 4. The annual unmitigated emissions for Option A and Option B would be the same; therefore, the values in Table 4 represent emissions associated with either option (see Appendix B). In addition, estimated emissions from the Bridge Access Option would be the same for Option A and Option B and are also presented in Table 4. Emissions of ROG would be less than the EKAPCD thresholds, therefore, the air quality impact would be less than significant. Because thresholds have not been established for emissions of CO, SO₂, and PM_{2.5}, emissions were assumed to be less than significant. Emissions of NO_x and PM₁₀ would exceed the EKAPCD threshold accordingly, mitigation would be required. Section 5.1 summarizes construction mitigation measures.

TABLE 4
Unmitigated Annual Construction Emissions

Construction Emission Source	Emissions (tpy)					
	NO _x	CO	ROG	SO ₂	PM ₁₀	PM _{2.5}
Bridge Access Option	3	2	0.5	0.002	0.6	0.2
Wind Facility:						
Onsite construction emissions	24	18	4.5	0.01	60	8.2
Offsite construction emissions	6.3	2.9	0.4	0.01	1.2	0.4
TOTAL (tpy)	33	23	5	0.02	62	9
EKAPCD Thresholds (tpy)	25	NA	25	NA	15	NA

Note: Onsite NO_x emissions include a 40% reduction to account for diesel-fueled equipment being equipped with engines meeting Tier 3 emission standards.

NA = EKAPCD has not established a threshold for this pollutant.

Mitigated construction emissions are presented in Table 5. The annual mitigated emissions for Option A and Option B would be the same; therefore the values in Table 4 represent emissions associated with either option (see Appendix B). In addition, estimated emissions from the Bridge Access Option would be the same for Option A and Option B and are also presented in Table 5. With implementation of mitigation measures AQ-1 and AQ-2, NO_x and PM₁₀ emissions would still exceed the EKAPCD thresholds. Therefore, NO_x and PM₁₀ emissions during project construction result in a temporary and unavoidable significant

impact to air quality. To further evaluate PM₁₀ emissions, dispersion modeling was conducted to estimate ambient PM₁₀ concentrations resulting from project construction.

TABLE 5
Mitigated Annual Construction Emissions

Construction Emission Source	Emissions (tpy)					
	NO _x	CO	ROG	SO ₂	PM ₁₀	PM _{2.5}
Bridge Access Option	3	2	0.5	0.002	0.6	0.2
Onsite construction emissions	24	18	4.5	0.01	36	5.8
Offsite construction emissions	6.3	2.9	0.4	0.01	1.2	0.4
TOTAL (tpy)	33	23	5	0.02	38	6
EKAPCD Thresholds (tpy)	25	NA	25	NA	15	NA

Note: Onsite NO_x emissions include a 40% reduction to account for diesel-fueled equipment being equipped with engines meeting Tier 3 emission standards.

NA = EKAPCD has not established a threshold for this pollutant.

3.3.1.2 Dispersion Modeling

Worst-case 24-hour PM₁₀ and PM_{2.5} emission rates for construction were calculated based on the highest monthly emissions divided by the number of days per month. Emissions were divided among multiple volume sources characterizing the WTG areas and project haul roads at approximately 50-meter intervals. The worst-case predicted PM₁₀ and PM_{2.5} concentrations from Option A and Option B are presented in Table 6.

To evaluate impacts, worst-case concentrations were added to the maximum recorded background concentration (Table 3) and compared to the federal and state ambient air quality standards. For the federal 24-hour PM₁₀ standard, adding the maximum modeled PM₁₀ concentration of 63 µg/m³ from construction of Option A to the maximum PM₁₀ monitored concentration of 144.8 µg/m³ (measured in 2008), would result in an exceedance of the standard (150 µg/m³). The federal 24-hour PM₁₀ standard is attained when 24-hour average concentrations, within a calendar year, above 150 µg/m³, are equal to or less than one. To determine whether project construction could contribute to an exceedance of the federal standard, the second highest PM₁₀ concentration modeled for Option A was added to the maximum PM₁₀ monitored concentration (144.8 µg/m³). Adding the second highest PM₁₀ concentration modeled for Option A (60 µg/m³) to the maximum PM₁₀ monitored concentration would result in an exceedance of the federal standard (150 µg/m³). Therefore, the project could potentially result in contributing to an exceedance of the federal standard based on the modeled results and highest observed background concentration. However, 24-hour PM₁₀ concentrations monitored in the years 2006, 2007, and 2009 were in the range of 58 to 78 µg/m³, which are much lower than the maximum background concentration (144.8 µg/m³). If the second highest modeled PM₁₀ concentration for Option A (60 µg/m³), was added to the lower background concentrations, the federal 24-hour PM₁₀ standard would not be exceeded. Construction would be short-term, lasting approximately 9 to 12 months, and mitigation measure AQ-2 would be implemented to control fugitive dust emissions throughout the construction period. As a result, project construction is not expected to cause a violation of the federal 24-hour PM₁₀ standard. Option B would have the same impacts as discussed for Option A in this paragraph.

Background PM_{10} concentrations currently exceed the state 24-hour standard. Therefore, PM_{10} emissions from construction of Option A or Option B would further contribute to an exceedance of the state standard. Based on the dispersion modeling results, the PM_{10} ambient concentrations would decrease by approximately half of the maximum modeled concentration within 300 meters of the project fenceline. The majority of the construction PM_{10} emissions, more than 90 percent, would result from fugitive dust sources. Therefore, BMPs and mitigation measures would be implemented to control dust emissions to the extent feasible. However, the impact would remain significant and unavoidable after mitigation due to the high background PM_{10} concentrations.

For Option A, the maximum modeled $PM_{2.5}$ concentration combined with the maximum background concentration would be slightly greater than the 24-hour standard (Table 6). For Option B, the maximum modeled $PM_{2.5}$ concentration combined with the maximum background concentration would be less than the 24-hour standard (Table 6). The federal 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. The maximum three-year average of background concentrations is $20.5 \mu\text{g}/\text{m}^3$ (Table 3). When combined with the maximum three-year 98th percentile modeled concentration of $9.4 \mu\text{g}/\text{m}^3$ for Option A, the predicted concentration would be less than the 24-hour standard of $35 \mu\text{g}/\text{m}^3$. Therefore, construction of the project would not cause or contribute to an exceedance of the federal 24-hour $PM_{2.5}$ standard.

For the state 24-hour $PM_{2.5}$ standard ($35 \mu\text{g}/\text{m}^3$), the standard is not to be exceeded. Therefore, adding the worst-case ambient concentration from construction of Option A to the maximum background concentration, measured in the year 2006, could contribute to an exceedance of the state standard. However, adding the ambient concentration from construction of Option A to the background concentrations measured in the years 2007 through 2009 would result in a concentration less than the 24-hour standard of $35 \mu\text{g}/\text{m}^3$. In addition, based on the dispersion modeling results, the $PM_{2.5}$ ambient concentrations would decrease by approximately half of the maximum modeled concentration within 700 meters of the project fenceline. For Option B, adding the worst-case ambient concentration from construction the maximum background concentration would result in a concentration less than the state standard. Therefore, construction of Option A or Option B are not expected to contribute to an exceedance of the state $PM_{2.5}$ standard.

Construction emissions for Option A and Option B were estimated using conservative assumptions and emission factors, the activities would be temporary and finite, and best available fugitive dust emission control techniques would be used throughout the construction period. Therefore, the project is not anticipated to cause or significantly contribute to a measured exceedance of the federal 24-hour PM_{10} standard or the federal and state $PM_{2.5}$ standards but may result in a temporary, unavoidable impact to the state 24-hour PM_{10} standard.

TABLE 6
Worst-Case Predicted 24-Hour PM₁₀ and PM_{2.5} Maximum Concentrations

Pollutant	Maximum Modeled 24-hr Impact (µg/m ³)	Maximum Background Concentration (µg/m ³)	Total Predicted Impact (µg/m ³)	NAAQS (µg/m ³)	CAAQS (µg/m ³)
Option A - PM ₁₀	63	144.8	208	150	50
Option A - PM _{2.5}	13.9	21.3	35.2	35	35
Option B - PM ₁₀	56	144.8	201	150	50
Option B - PM _{2.5}	12.9	21.3	34.2	35	35

3.3.1.3 Sensitive Receptors

As described previously, sensitive receptors are locations such as residences, schools, or hospitals. During construction, sensitive receptors may be exposed to short-term emissions of TACs, specifically diesel particulate matter. Construction would result in approximately 1.5 tpy of PM_{2.5} emissions from diesel construction equipment. Concentrations of mobile-source diesel particulate matter emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB, 2005). The closest sensitive receptor to the project is located over 1,000 feet from the site. Therefore, sensitive receptors would not be expected to be exposed to substantial pollutant concentrations during construction.

3.3.1.4 Odors

Project construction would involve the temporary use of vehicles and construction equipment that would not generate significant odors; therefore, there would be no impact from odorous emissions during construction.

3.3.1.5 Valley Fever

Construction of the project would result in fugitive dust emissions that could potentially contain valley fever spores. However, the soil in the project area consists of recent-age alluvial deposits, primarily derived from erosion of Pleistocene- to Pliocene-age non-marine fan and terrace deposits sourced from the southeastern flanks of the Tehachapi Mountains, which are not expected to contain valley fever spores (USDA NRCS, 2010 and WZI, 2009). Furthermore, construction activities that may generate fugitive dust would be controlled through implementation of a dust control plan required as compliance with EKAPCD Rule 402. The risk of exposure to valley fever during construction would be less than significant.

3.3.1.6 Greenhouse Gas Emissions

Construction of the project would result in a temporary increase in GHG emissions. The EKAPCD has not established a quantitative GHG threshold to evaluate impacts; therefore, the GHG emissions were evaluated in comparison to the ARB GHG reporting regulation threshold of 10,000 metric tons CO_{2e} per year and the AB 32 2020 emissions limit. Under AB 32, the ARB developed a statewide GHG inventory to establish the 2020 emissions limit. The

inventory includes emissions from sectors such as energy, transportation, and industrial sources. The short-term increase in GHG emissions (total of 6,117 metric tons CO₂e) during construction is less than the 10,000 metric ton reporting threshold and minimal when compared to the AB 32 2020 emissions limit of 427 million metric tons CO₂e. In addition, as discussed below, operation of the project would result in a long-term decrease in GHG emissions. Therefore, construction of the project would have a less-than-significant impact on the environment from GHG emissions.

3.3.2 Operation Impacts

Project operation would result in emissions from routine maintenance activities and potential operation of emergency propane generators. Operation emissions associated with Option A and Option B would be the same. Therefore, the discussion in this section presents the impact assessment for operation of either Option A or Option B.

3.3.2.1 Operation Emissions

Project operation would result in minor emissions from routine maintenance activities. As shown in Table 7, operation emissions would be lower than the EKAPCD significance thresholds. In addition, the project may potentially displace energy generated from fossil-fuel-fired energy sources and would help meet the region's power demands without creating a continuous source of emissions. Therefore, the air quality impact from operation of the project would be less than significant.

TABLE 7
Annual Operation Emissions

Emission Source	Emissions (tpy)					
	NO _x	CO	ROG	SO ₂	PM ₁₀	PM _{2.5}
Operation emissions	1.9	1.9	1.0	0.03	4.7	0.6
EKAPCD Thresholds (tpy)	25	NA	25	NA	15	NA

Note:

NA = EKAPCD has not established a threshold for this pollutant.

3.3.2.2 Dispersion Modeling

Dispersion modeling of operation emissions was not conducted because PM₁₀ emissions would be below the EKAPCD threshold.

3.3.2.3 Sensitive Receptors

Project operation would result in minor emissions (as described previously); therefore, the air quality impact to sensitive receptors would be less than significant.

3.3.2.4 Odors

The project would not include the types of sources, such as a wastewater treatment plant, typically associated with odorous emissions. Therefore, project operation would not create objectionable odors affecting a substantial number of people and the air quality impact would be less than significant.

3.3.2.5 Valley Fever

As discussed previously, the project site is not expected to be underlain by the types of soil that would contain valley fever spores. In addition, operation of the project would not include continuous disturbance of soil that could release valley fever spores. Therefore, the impact from exposure to valley fever during operation would be less than significant.

3.3.2.6 Greenhouse Gas Emissions

Project operation would generate minor GHG emissions as presented in Table 8. Over the life of the project, the energy generated would contribute to increasing the in-state-generated renewable energy portfolio. Furthermore, the project would help the state meet the renewable energy standard required by 2020. Increasing the renewable energy standard is one of the measures intended to reduce GHG emission in California (ARB, 2008).

Operation of the project may potentially reduce statewide GHG emissions by displacing fossil-fuel-generated electricity. Assuming the project generates 762,120 MWh per year, the energy generated could displace up to 332,902 metric tons of CO₂ emissions per year when compared to electricity generated from natural gas combustion. Therefore, operation of the project would have a less-than-significant impact on the environment from GHG emissions.

TABLE 8
Annual GHG Emissions From Project Operation

Emissions Source	CO ₂ Emissions (metric tons/yr)
Vehicles (equipment, trucks, worker commute)	261
Emergency Propane Generators	39
Potential Emissions Displaced	-332,902

Displaced emissions estimated in comparison to energy generated from natural gas combustion.

3.3.3 NEPA

As shown in Sections 3.3.1 and 3.3.2, construction and operation emissions would be less than the significance thresholds, except for NO_x and PM₁₀ emissions from construction. However, as discussed previously, the PM₁₀ concentrations from construction, with implementation of a fugitive dust control plan, would not be expected to cause a new violation of the NAAQS for PM₁₀. In addition, NO_x and ROG emissions would be less than the general conformity *de minimis* thresholds (see Appendix C). Therefore, under NEPA, the project would not have an adverse effect on air quality from construction or operation.

The project would include approval by a federal agency, BLM, and is located in a nonattainment area for ozone (former subpart 1),⁴ so emissions of ozone precursors, ROG and NO_x, and the general conformity *de minimis* threshold of 100 tpy were used to evaluate applicability. Construction NO_x and ROG emissions would be less than 100 tpy so a

⁴ According to 74 FR 2935. Implementation of the 1997 8-Hr Ozone NAAQS: Classification of Subpart 1 Areas and Revision to Anti-Backsliding Provisions; Deletion of Obsolete 1-Hr Ozone Standard Provisions, the proposed designation for Kern County is moderate nonattainment.

conformity determination would not be required. The general conformity applicability analysis is included in Appendix C.

SECTION 4

Cumulative Impacts

This chapter evaluates the cumulative impacts of the project based on localized impacts, consistency with plans, and by comparison to regional emission inventories in accordance with the Kern County *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports*.

4.1 Localized Impacts

Cumulative impacts are impacts that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts from the project. Localized cumulative impacts were assessed by reviewing other projects located within 1 mile and 6 miles of the project site. No other projects are located within 1 mile of the project site. However, three projects—Windswept, Coram, and Eagle Energy, all wind energy projects—would be located within 6 miles of the project site. Additionally, AWD is proposing additional wind energy projects also located in Kern County. While these projects proposed by AWD would likely be located more than six miles from the project, construction is anticipated to occur in the year 2012, similar to the project. Table 9 presents the information for the projects considered in the cumulative impact assessment. Construction or operation of the project may result in a cumulative impact when considered in combination of these other three projects.

TABLE 9
Cumulative Projects within 6 Miles of the Project

Project Name	Description	Project Area
Windswept	Includes approval of a zone change and a conditional use permit to allow for the construction of wind turbines that are expected to produce 72 MW of power.	1,100 acres
Coram	Includes approval of a zone change and a conditional use permit to allow for the construction of wind turbines that are expected to produce 6 MW of power.	130 acres
Eagle Energy	12 turbines.	300 acres

Project construction would result in short-term emissions of NO_x, ROG, CO, SO_x, PM₁₀, and PM_{2.5}. As presented previously, construction would result in a less-than-significant impact from emissions of ROG, CO, SO_x, and PM_{2.5}; therefore the local cumulative impact would be less than significant. However, NO_x and PM₁₀ emissions from project construction could have a potentially significant impact on air quality. Therefore, short-term construction NO_x and PM₁₀ emissions from the Coram, Windswept, and Eagle Energy projects, when considered in combination with the proposed project, would result in a temporary and unavoidable significant local cumulative impact.

Long-term emissions from project operation would have a less-than-significant impact on air quality. In addition, the project may potentially displace energy generated from fossil-fuel-fired energy sources and would help meet the region's power demands without creating a continuous source of emissions. When considered in combination with other wind energy projects, which would also contribute a renewable energy source, the cumulative impact would be less than significant.

4.2 Consistency with Plans

Cumulative impacts of the project were also considered in the context of the following plans:

- Kern Council of Governments (COG) conformity and Traffic Analysis Zones
- Ozone Attainment Plan
- Kern County General Plan
- Mojave Specific Plan
- ARB Scoping Plan

The Kern COG is an association of city and county governments primarily created to address regional transportation issues. The Kern COG conformity analysis for the 2011 Federal Transportation Improvement Program (FTIP)/Regional Transportation Plan (RTP) addresses motor vehicle emissions in Kern County from regionally significant transportation projects planned in the county (Kern Council of Governments. 2010.). The project is not a highway or other transportation project that would be required to comply with transportation conformity and therefore, would not be considered in the Kern COG conformity analysis. In addition, the 2011 FTIP/RTP does not include transportation control measures (TCMs) for eastern Kern County because this area is not required to develop TCMs (EKAPCD, 2005). The regional transportation modeling in the conformity analysis divides the county into many traffic analysis zones. Project operation would add approximately 15 employee commute trips, which would not be expected to impact traffic conditions in the traffic analysis zones. Therefore, operation of the project would not conflict with regional transportation planning.

Consistency with the EKAPCD ozone attainment plan was evaluated based on whether emissions of ozone precursors would exceed the EKAPCD significance thresholds. Construction of the project would result in short-term emissions of the ozone precursors, NO_x and ROG, from construction equipment and vehicle exhaust. However, as described previously, the emissions would be less than the EKAPCD significance thresholds. Operation of the project would also result in emissions of the ozone precursors, NO_x and ROG, less than the EKAPCD thresholds. Therefore, construction and operation of the project would not conflict with the EKAPCD ozone attainment plan.

Construction and operation of the project were also evaluated for consistency with the policies in the Kern County General Plan and the Mojave Specific Plan. Construction and operation emissions would be less than the EKAPCD significance thresholds, except for construction NO_x and PM₁₀ emissions. However, project construction would include the use of Tier 3 compliant construction equipment and implementation a fugitive dust control plan as a mitigation measure to reduce emissions of PM₁₀. Therefore, construction and operation of the project would be consistent with the policies in the Kern County General Plan and the Mojave Specific Plan.

The ARB Scoping Plan document (ARB, 2008) outlines the actions to reduce GHG emissions in California. One of the measures in the Scoping Plan addresses increasing electricity generated from renewable energy sources, such as wind energy, through increasing the renewable energy standard to 33 percent by the year 2020. Construction and operation of a wind energy project, such as the Alta East Wind Project, would contribute to meeting the requirements of this measure. Therefore, the project would be consistent with the goals of the ARB Scoping Plan for reducing GHG emissions in the state.

In summary, construction and operation of the project would be consistent with the plans that would be applicable to the project.

4.3 Regional Emissions Inventories

Each year, ARB publishes the California Almanac of Emissions and Air Quality (Almanac). The Almanac contains 20-year trend summaries of air quality and emissions data. The current year, 2010 (2011 data is not available), and the year 2020 projections were summarized for Kern County and the MDAB and used to evaluate cumulative impacts. The 2009 edition of the Almanac was used to summarize the emission inventories presented in Tables 10 through 14. Because the project is located in a state nonattainment area for ozone (represented by NO_x and ROG, which are ozone precursors) and PM₁₀, the emission inventories for these pollutants were evaluated for cumulative impacts. As shown in Table 14, the long-term project emissions would be less than one percent of either the Kern County or MDAB emission inventories. Therefore, the regional cumulative air quality impact from the project would be less than significant.

TABLE 10
Emission Inventory for the Kern County Portion of the MDAB – Year 2010

Source	Emissions (tpy)		
	ROG	NO _x	PM ₁₀
Total Emissions	14,235	20,440	12,994
Percent stationary sources	3%	37%	19%
Percent area-wide sources	5%	1%	58%
Percent mobile sources	27%	60%	12%
Percent natural sources	65%	2%	12%
Total stationary sources	438	7,629	2,446
Total area wide sources	767	110	7,483
Total mobile sources	3,796	12,264	1,570
Total natural sources	9,198	475	1,497

Source: ARB, 2009

TABLE 11
Emission Inventory for the MDAB – Year 2010

Source	Emissions (tpy)		
	ROG	NOx	PM ₁₀
Total Emissions	47,596	92,236	77,417
Percent stationary sources	13%	32%	23%
Percent area wide sources	13%	1%	68%
Percent mobile sources	45%	66%	5%
Percent natural sources	30%	1%	5%
Total stationary sources	6,023	29,419	17,447
Total area wide sources	5,950	803	52,268
Total mobile sources	21,243	60,992	4,198
Total natural sources	14,381	1,022	3,504

Source: ARB, 2009

TABLE 12
Emission Inventory for the Kern County Portion of the MDAB – Year 2020

Source	Emissions (tpy)		
	ROG	NOx	PM ₁₀
Total Emissions	13,688	18,871	13,250
Percent stationary sources	4%	55%	24%
Percent area wide sources	6%	1%	54%
Percent mobile sources	22%	42%	11%
Percent natural sources	67%	3%	11%
Total stationary sources	584	10,330	3,176
Total area wide sources	803	110	7,191
Total mobile sources	3,066	7,957	1,424
Total natural sources	9,198	475	1,497

Source: ARB, 2009

TABLE 13
Emission Inventory for the MDAB – Year 2020

Source	Emissions (tpy)		
	ROG	NOx	PM ₁₀
Total Emissions	48,509	75,592	83,512
Percent stationary sources	15%	46%	25%
Percent area wide sources	15%	1%	67%
Percent mobile sources	41%	52%	4%
Percent natural sources	30%	1%	4%
Total stationary sources	7,045	34,748	20,659
Total area wide sources	7,300	840	55,699
Total mobile sources	19,783	38,982	3,650
Total natural sources	14,381	1,022	3,504

Source: ARB, 2009

TABLE 14
Emission Projections for the Year 2020 – Project, Kern County, and MDAB

Source	Emissions (tpy)		
	ROG	NOx	PM ₁₀
Project	1.0	1.9	4.7
Kern County	13,688	18,871	13,250
MDAB	48,509	75,592	83,512
Project Percent of Kern County	<0.01%	<0.01%	0.03%
Project Percent of MDAB	<0.01%	<0.01%	<0.01%
Kern County Percent of MDAB	28%	25%	16%

Note: The emission estimates for Kern County and the MDAB are based on 2020 projections. The project emission estimates are for the year of 2013.

This chapter evaluated the potential cumulative impacts of the project based on localized impacts, consistency with plans, and by comparison to regional emission inventories. Construction of the project would have a locally, cumulatively significant impact from NOx and PM₁₀ emissions because project construction would have a short-term, unavoidable significant air quality impact. Operation of the project would have a less-than-significant cumulative, local impact on air quality. Construction and operation of the project would be consistent with the plans that would be applicable to the project and would have a less-than-significant impact. Finally, when considered in the context of regional emission projections, the project would represent a minor contribution to regional emissions and would have a less-than-significant impact.

SECTION 5

Mitigation Measures

This chapter presents the mitigation measures required to reduce emissions from the project.

5.1 Construction Mitigation Measures

The following construction mitigation measure would be implemented to reduce construction NO_x and fugitive dust emissions. Because over 90 percent of the PM₁₀ emissions from construction would result from fugitive dust sources, the mitigation measure AQ-2 focuses on reducing fugitive dust emissions.

Mitigation Measure AQ-1 (AQ-1)

The following mitigation measures would be implemented to reduce NO_x emissions during construction:

- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]).
- During all construction activities, diesel-fueled off-road equipment with maximum power greater than 25 horsepower and that are not qualified to be registered under the ARB's Statewide Portable Equipment Registration Program, will be equipped with Tier 3 engines certified by ARB or with engines certified by the EKAPCD to provide equivalent benefits. All fleets of diesel-fueled off-road vehicles shall comply with NO_x emissions standards per CCR Title 13, Article 4.8, Chapter 9, Section 2449.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications.

Mitigation Measure AQ-2 (MM AQ-2)

A Fugitive Dust Control Plan will be implemented in compliance with EKAPCD Rule 402 to reduce PM₁₀ emissions during construction. According to V.D.9 of Rule 402, "A contractor may have on file with the District a pre-approved plan or plans for one or more types of large projects. Prior to initiation of any project, one or more applicable preapproved plans may be specified by the contractor in lieu of filing a new plan or plans." Therefore, the Fugitive Dust Control Plan approved for the Alta-Oak Creek Mojave project may be used in lieu of filing a new plan, or a new plan will be submitted for approval by EKAPCD.

Mitigation measure AQ-1 includes implementation of the following mitigation measures for air quality from the BLM PEIS (BLM, 2005). The Fugitive Dust Control Plan would be reviewed to confirm measures equivalent to the following are included in the plan.

Mitigation measures for areas subject to vehicular travel

- Access roads and onsite roads should be surfaced with aggregate materials, wherever appropriate.
- Dust abatement techniques should be used on unpaved, unvegetated surfaces to minimize airborne dust.
- Speed limits should be posted and enforced to reduce airborne fugitive dust.

Mitigation measures for soil and material storage and handling

- Workers should be trained to handle construction material to reduce fugitive emissions.
- Construction materials and stockpiled soils should be covered if they are a source of fugitive dust.
- Storage piles at concrete batch plants should be covered if they are a source of fugitive dust.

Mitigation measures for clearing and disturbing land

- Disturbed areas should be minimized.
- Dust abatement techniques should be used as earthmoving activities proceed and prior to clearing.

Mitigation measures for earthmoving

- Dust abatement techniques should be used before excavating, backfilling, compacting, or grading.
- Disturbed areas should be revegetated as soon as possible after disturbance.

5.2 Operation Mitigation Measures

Operation of the project would not require mitigation.

SECTION 6

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MOJAVE, CALIFORNIA

Period of Record General Climate Summary - Temperature

Station 012740 MOJAVE

From Year 1949 To Year 2010

Monthly Summary				Daily Totals			Monthly Summary			Daily Summary			
Year	Month	Max	Min	Max	Min	Avg	Max	Min	Avg	1st	2nd	3rd	4th
1949	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1950	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1951	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1952	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1953	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1954	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1955	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1956	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1957	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1958	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1959	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1960	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1961	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1962	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1963	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1964	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1965	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1966	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1967	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1968	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1969	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1970	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1971	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1972	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1973	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1974	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1975	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1976	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1977	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1978	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1979	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1980	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1981	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1982	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1983	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1984	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1985	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1986	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1987	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1988	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1989	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1990	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1991	Jan	43	24	34	10	24	43	24	24	1	1	1	1
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1998	Jan	43	24	34	10	24	43	24	24	1	1	1	1
1999	Jan	43	24	34	10	24	43	24	24	1	1	1	1
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2001	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2002	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2003	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2004	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2005	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2006	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2007	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2008	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2009	Jan	43	24	34	10	24	43	24	24	1	1	1	1
2010	Jan	43	24	34	10	24	43	24	24	1	1	1	1

Appendix A Climate Summaries for Mojave, California

MOJAVE, CALIFORNIA

Period of Record General Climate Summary - Temperature

Station:(045756) MOJAVE															
From Year=1904 To Year=2010															
	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.		Min. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32 F	<= 32 F	<= 0 F
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Days	# Days	# Days
January	57.8	34.2	46.2	82	26/1909	10	06/1913	62.9	1908	39.8	1979	0.0	0.0	13.3	0.0
February	61.2	37.1	49.3	90	28/1914	16	06/1989	58.5	1910	40.1	1912	0.0	0.0	7.3	0.0
March	64.7	41.0	52.8	89	31/1966	17	02/1971	61.6	1908	36.5	1912	0.0	0.0	3.4	0.0
April	71.3	46.3	59.0	99	18/1914	27	20/1972	68.5	1989	50.5	1975	0.6	0.0	0.5	0.0
May	79.9	55.1	67.5	104	28/2003	32	21/1908	80.2	1904	58.3	1977	5.4	0.0	0.0	0.0
June	89.9	63.8	76.9	112	26/1914	38	01/1967	82.9	1909	71.1	1908	17.2	0.0	0.0	0.0
July	97.7	69.8	83.5	117	23/1914	43	06/1979	95.7	1905	76.8	1912	27.7	0.0	0.0	0.0
August	96.4	68.0	82.3	118	05/1914	48	23/1909	90.8	1905	74.9	1909	26.9	0.0	0.0	0.0
September	89.0	60.3	74.8	110	03/1908	31	30/1909	82.7	1907	65.9	1911	16.6	0.0	0.0	0.0
October	78.5	50.3	64.4	100	03/1980	22	30/1971	77.1	1905	53.0	1911	3.5	0.0	0.5	0.0
November	65.7	40.2	53.0	96	03/1914	13	24/1979	66.3	1907	43.0	1911	0.1	0.0	5.3	0.0
December	57.2	32.9	45.0	79	06/1977	8	23/1990	52.2	1980	34.0	1911	0.0	0.1	15.3	0.0
Annual	75.8	49.9	62.9	118	19140805	8	19901223	64.2	2001	60.5	1971	98.0	0.1	45.8	0.0
Winter	58.7	34.7	46.8	90	19140228	8	19901223	51.2	1909	41.0	1979	0.0	0.1	36.0	0.0
Spring	72.0	47.5	59.8	104	20030528	17	19710302	65.3	1904	51.5	1912	6.0	0.0	3.9	0.0
Summer	94.6	67.2	80.9	118	19140805	38	19670601	87.9	1905	76.6	1983	71.8	0.0	0.0	0.0
Fall	77.7	50.3	64.1	110	19080903	13	19791124	74.1	1907	54.0	1911	20.2	0.0	5.8	0.0

Table updated on Jan 14, 2011

For monthly and annual means, thresholds, and sums:

Months with 5 or more missing days are not considered

Years with 1 or more missing months are not considered

Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

MOJAVE, CALIFORNIA

Period of Record General Climate Summary - Precipitation

Station:(045756) MOJAVE													
From Year=1904 To Year=2010													
	Precipitation										Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.	>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in. dd/yyyy or yyyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	1.20	6.46	1995	0.00	1910	3.00 30/1915	4	2	1	0	0.8	9.5	1979
February	1.27	6.85	1998	0.00	1910	2.67 10/1978	4	2	1	0	0.4	11.0	1911
March	0.93	5.00	1912	0.00	1909	2.88 01/1983	3	2	1	0	0.2	3.5	1954
April	0.30	2.08	1965	0.00	1904	1.25 06/1906	2	1	0	0	0.0	0.5	1963
May	0.09	1.28	1977	0.00	1904	1.10 09/1977	1	0	0	0	0.0	0.0	1949
June	0.03	0.41	1963	0.00	1904	0.40 04/1984	0	0	0	0	0.0	0.0	1949
July	0.11	2.43	1984	0.00	1904	1.16 30/1984	0	0	0	0	0.0	0.0	1948
August	0.15	2.02	1983	0.00	1905	1.94 20/1995	1	0	0	0	0.0	0.0	1948
September	0.21	2.94	1976	0.00	1905	1.23 11/1976	1	1	0	0	0.0	0.0	1906
October	0.24	2.47	2004	0.00	1904	1.92 01/1981	1	1	0	0	0.0	0.0	1948
November	0.53	3.78	1967	0.00	1904	1.98 19/1967	2	1	0	0	0.1	6.5	1906
December	0.87	5.33	1943	0.00	1911	2.40 29/1965	3	2	1	0	0.2	7.0	2008
Annual	5.93	15.51	1983	0.85	1942	3.00 19150130	22	13	4	1	1.7	11.0	1962
Winter	3.33	11.68	1944	0.00	1912	3.00 19150130	11	7	2	1	1.4	11.0	1962
Spring	1.31	6.00	1912	0.00	1909	2.88 19830301	6	3	1	0	0.2	3.5	1954
Summer	0.30	3.12	1984	0.00	1907	1.94 19950820	1	1	0	0	0.0	0.0	1949
Fall	0.99	4.45	1967	0.00	1995	1.98 19671119	4	2	1	0	0.1	1.0	1952

Table updated on Jan 14, 2011

For monthly and annual means, thresholds, and sums:

Months with 5 or more missing days are not considered

Years with 1 or more missing months are not considered

Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

Western Regional Climate Center, wrcc@dri.edu

Appendix B Emission Calculations

Construction Emission Summary

Summary of Unmitigated Construction Emissions - Option A

Emission Source	Emissions (tons/yr)						Emissions (metric tons)	
	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CO2e
Bridge Access Option								
Bridge Access Option	0.45	2.13	3.02	0.002	0.62	0.23	551	580
Wind Facility								
Onsite Equipment	3.84	16.25	21.39	0.001	1.61	1.49	3,859	4,062
Onsite Vehicles	0.68	1.83	2.65	0.0043	0.18	0.15	407	428
Onsite Concrete Batch Plant	NA	NA	NA	NA	1.90	0.70	NA	NA
Onsite Fugitive Dust (land disturbance and unpaved roads)	NA	NA	NA	NA	56.41	5.87	NA	NA
Offsite Vehicles	0.35	2.96	6.30	0.01	1.17	0.40	993	1,046
TOTAL	5	23	33	0.02	62	9	5,811	6,117
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE	NE
Threshold Exceeded?	No	NA	Yes	NA	Yes	NA	NA	NA

1. The onsite equipment emissions include implementation of the BMP that equipment engines must meet Tier 3 emission standards. This assumes a 40% reduction in NOx due to implementation of the BMP.

2. URBEMIS2007 only estimates emissions of the greenhouse gas, CO₂. In addition, emissions of CH₄ and N₂O from combustion sources would be much lower than emissions of CO₂, contributing in the range of 2 to 4 percent of the CO₂e emissions. Therefore, it was assumed that CH₄ and N₂O emissions account for 5 percent of the CO₂e emissions so the CO₂ emissions were multiplied by 100/95 to calculate CO₂e emissions.

NA = Not applicable

NE = Threshold has not been established

Summary of Mitigated Construction Emissions - Option A

Emission Source	Emissions (tons/yr)						Emissions (metric tons)		
	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CO2e	
Bridge Access Option									
Bridge Access Option	0.45	2.13	3.02	0.002	0.62	0.23	551	580	
Wind Facility									
Onsite Equipment	3.84	16.25	21.39	0.001	1.61	1.49	3,859	4,062	
Onsite Vehicles	0.68	1.83	2.65	0.004	0.18	0.15	407	428	
Onsite Concrete Batch Plant	NA	NA	NA	NA	1.90	0.70	NA	NA	
Onsite Fugitive Dust (land disturbance and unpaved roads)	NA	NA	NA	NA	32.40	3.45	NA	NA	
Offsite Vehicles	0.35	2.96	6.30	0.011	1.17	0.40	993	1,046	
TOTAL	5	23	33	0.02	38	6	5,811	6,117	
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE	NE	
Threshold Exceeded?	No	NA	Yes	NA	Yes	NA	NA	NA	

1. The mitigated unpaved road fugitive dust emissions assume a 44% percent reduction due to implementing the mitigation measure to reduce vehicle speeds on unpaved roads to 15 mph.

2. The mitigated fugitive dust emissions from land disturbance assume a 5 % reduction due implementing the mitigation measure to replace ground cover in disturbed areas (from URBEMIS2007).

3. URBEMIS2007 only estimates emissions of the greenhouse gas, CO₂. In addition, emissions of CH₄ and N₂O from combustion sources would be much lower than emissions of CO₂, contributing in the range of 2 to 4 percent of the CO₂e emissions. Therefore, it was assumed that CH₄ and N₂O emissions account for 5 percent of the CO₂e emissions so the CO₂ emissions were multiplied by 100/95 to calculate CO₂e emissions.

NA = Not applicable

NE = Threshold has not been established

Summary of Unmitigated Construction Emissions - Option B

Emission Source	Emissions (tons/yr)					Emissions (metric tons)		
	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CO2e
Bridge Access Option								
Bridge Access Option	0.45	2.13	3.02	0.002	0.62	0.23	551	580
Wind Facility								
Onsite Equipment	3.84	16.25	21.39	0.0011	1.61	1.49	3,859	4,062
Onsite Vehicles	0.68	1.83	2.65	0.0043	0.18	0.15	407	428
Onsite Concrete Batch Plant	NA	NA	NA	NA	1.90	0.70	NA	NA
Onsite Fugitive Dust (land disturbance and unpaved roads)	NA	NA	NA	NA	56.52	5.89	NA	NA
Offsite Vehicles	0.35	2.96	6.30	0.011	1.17	0.40	993	1,046
TOTAL	5	23	33	0.02	62	9	5,811	6,117
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE	NE
Threshold Exceeded?	No	NA	Yes	NA	Yes	NA	NA	NA

1. The onsite equipment emissions include implementation of the BMP that equipment engines must meet Tier 3 emission standards. This assumes a 40% reduction in NOx due to implementation of the BMP.

2. URBEMIS2007 only estimates emissions of the greenhouse gas, CO₂. In addition, emissions of CH₄ and N₂O from combustion sources would be much lower than emissions of CO₂, contributing in the range of 2 to 4 percent of the CO₂e emissions. Therefore, it was assumed that CH₄ and N₂O emissions account for 5 percent of the CO₂e emissions so the CO₂ emissions were multiplied by 100/95 to calculate CO₂e emissions.

NA = Not applicable

NE = Threshold has not been established

Summary of Mitigated Construction Emissions - Option B

Emission Source	Emissions (tons/yr)						Emissions (metric tons)		
	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CO2e	
Bridge Access Option									
Bridge Access Option	0.45	2.13	3.02	0.002	0.62	0.23	551		580
Wind Facility									
Onsite Equipment	3.84	16.25	21.39	0.0011	1.61	1.49	3,859		4,062
Onsite Vehicles	0.68	1.83	2.65	0.0043	0.18	0.15	407		428
Onsite Concrete Batch Plant	NA	NA	NA	NA	1.90	0.70	NA		NA
Onsite Fugitive Dust (land disturbance and unpaved roads)	NA	NA	NA	NA	32.51	3.48	NA		NA
Offsite Vehicles	0.35	2.96	6.30	0.011	1.17	0.40	993		1046
TOTAL	5	23	33	0.02	38	6	5,811		6,117
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE		NE
Threshold Exceeded?	No	NA	Yes	NA	Yes	NA	NA		NA

1. The mitigated unpaved road fugitive dust emissions assume a 44% percent reduction due to implementing the mitigation measure to reduce vehicle speeds on unpaved roads to 15 mph.

2. The mitigated fugitive dust emissions from land disturbance assume a 5 % reduction due implementing the mitigation measure to replace ground cover in disturbed areas (from URBEMIS2007).

3. URBEMIS2007 only estimates emissions of the greenhouse gas, CO₂. In addition, emissions of CH₄ and N₂O from combustion sources would be much lower than emissions of CO₂, contributing in the range of 2 to 4 percent of the CO₂e emissions. Therefore, it was assumed that CH₄ and N₂O emissions account for 5 percent of the CO₂e emissions so the CO₂ emissions were multiplied by 100/95 to calculate CO₂e emissions.

NA = Not applicable

NE = Threshold has not been established

Construction On-Site Vehicles

On-Site Vehicle Emissions

On-Site Vehicle Emissions		Emissions (tons/yr)										Emissions (metric tons/yr)	
		Construction Activity	Number of Vehicles	Vehicle Type	Miles Traveled per Day	Number of Days	ROG	CO	NOx	SOx	PM10 - Exhaust	PM10 - Fugitive Dust	PM2.5 - Exhaust
Bridge Access Option	3						Pickup (gasoline)	5	72	0.0002	0.0050	0.0004	0.0000
Site Preparation/Access Road Construction	1	Flatbed Truck (diesel)	10	45	0.0029	0.0061	0.0115	0.0000	0.0008	0.1250	0.0007	0.0125	1
	3	Pickup (gasoline)	10	45	0.0003	0.0062	0.0005	0.0000	0.0001	0.3749	0.0001	0.0375	1
Foundation Construction	4	Haul Truck (diesel)	20	78	0.0405	0.0851	0.1598	0.0002	0.0107	1.7328	0.0096	0.1733	20
	24	Concrete Trucks (diesel)	10	26	0.0401	0.0843	0.1582	0.0002	0.0106	1.7155	0.0095	0.1716	20
	4	Work Truck (gasoline)	20	78	0.0013	0.0289	0.0022	0.0001	0.0004	1.7328	0.0003	0.1733	6
	4	Haul Truck (diesel)	20	78	0.0405	0.0851	0.1598	0.0002	0.0107	1.7328	0.0096	0.1733	20
Collection System Construction	4	Work Truck (gasoline)	20	78	0.0013	0.0289	0.0022	0.0001	0.0004	1.7328	0.0003	0.1733	6
Transmission Line Construction	4	Haul Truck (diesel)	20	50	0.0260	0.0546	0.1025	0.0001	0.0068	1.1108	0.0061	0.1111	13
	12	Concrete Trucks (diesel)	10	14	0.0104	0.0220	0.0412	0.0001	0.0028	0.4471	0.0025	0.0447	5
	4	Flatbed Truck (diesel)	20	120	0.0623	0.1309	0.2459	0.0003	0.0164	2.6659	0.0147	0.2666	30
	6	Work Truck (gasoline)	20	120	0.0030	0.0666	0.0051	0.0001	0.0010	3.9988	0.0007	0.3999	13
Substation Construction	2	Wire Reel Truck (diesel)	20	120	0.0311	0.0655	0.1229	0.0002	0.0082	1.3329	0.0000	0.1333	15
	1	Haul Truck (diesel)	20	73	0.0095	0.0199	0.0374	0.0000	0.0025	0.4054	0.0022	0.0405	5
	12	Concrete Trucks (diesel)	10	14	0.0104	0.0220	0.0412	0.0001	0.0028	0.4471	0.0025	0.0447	5
	2	Work Truck (gasoline)	20	73	0.0006	0.0135	0.0010	0.0000	0.0002	0.8109	0.0002	0.0811	3
WTG Installation	20	Work Truck (gasoline)	20	149	0.0125	0.2758	0.0212	0.0006	0.0042	16.5508	0.0031	1.6551	53
	20	Haul Truck (diesel)	30	100	0.3893	0.8183	1.5368	0.0020	0.1027	16.6619	0.0920	1.6662	190
Site Cleanup/Restoration	3	Work Truck (gasoline)	20	45	0.0006	0.0125	0.0010	0.0000	0.0002	0.7498	0.0001	0.0750	2
Unmitigated TOTAL					0.6827	1.8261	2.6506	0.0043	0.1815	54.3281	0.1542	5.4328	407
Fugative Dust Mitigated TOTAL					0.6827	1.8261	2.6506	0.0043	0.1815	30.4238	0.1542	3.0424	407

1. The number of vehicles, vehicle type, miles traveled, and number of days provided by TGP.

2. The mitigated emissions assume a 44% percent reduction in fugitive emissions due to reducing vehicle speeds on unpaved roads to 15 mph.

Construction On-Site Concrete Batch Plant Emissions

Concrete Batch Plant Emissions

Source	Annual Value	Units	Emission Factor	Units	PM10 Emissions (tons/yr)	Emission Factor
Concrete Batch Plant	160,960	tons	0.023	lb/tons	1.9	0.008
Storage Piles	40	acres	1.7	lbs/acre	0.034	1.7

Batch Plant Controlled Emission Factors^a

Sand Transfer ^b	0.000297	lb PM ₁₀ /ton cement	0.000297	lb PM _{2.5} /ton cement
Aggregate Transfer ^b	0.00099	lb PM ₁₀ /ton cement	0.00099	lb PM _{2.5} /ton cement
Cement Unloading to Storage Silo	0.00034	lb PM ₁₀ /ton cement	0.00034	lb PM _{2.5} /ton cement
Cement Supplement Unloading to Storage Silo	0.0049	lb PM ₁₀ /ton cement	0.0049	lb PM _{2.5} /ton cement
Weigh Hopper Loading ^b	0.00072	lb PM ₁₀ /ton cement	0.00072	lb PM _{2.5} /ton cement
Truck Loading ^c	0.016	lb PM ₁₀ /ton cement	0.001	lb PM _{2.5} /ton cement ^d
Total	0.023	lb PM ₁₀ /ton cement	0.008	lb PM _{2.5} /ton cement

^aEmission factors from AP-42, Section 11.12, June 2006

^b The batch plant will have dust control equipment and was assumed to control dust emissions with an efficiency of 70% during sand and aggregate transfer.

Source for control efficiency: BAAQMD Permit Handbook, Section 11.5 Concrete Batch Plants, March 2009

^c It was assumed the truck loading process would also include dust controls. Therefore, the controlled truck loading emission factor was used.

^d It was assumed the PM_{2.5} emission factors would be the same as PM₁₀ except for the truck loading. The PM_{2.5} truck loading emission factor was obtained from the EPA document, *Emission Factor Documentation for AP-42 Section 11.12 Concrete Batching, Table 18.5* (June 2006). Similar to PM₁₀, it was assumed the process would also include dust controls so the controlled truck loading emission factor was used.

Concrete Batch Plant Storage Pile PM10 Emissions

Emission Factor: 1.7 lb PM₁₀/acre/day

Source: BAAQMD Permit Handbook, Section 11.5 Concrete Batch Plants, March 2009

Project Concrete Amounts:

Daily Batch Plant Rate	1,000	yd3/day
Concrete Density ^a	4,024	lbs/yd3
Daily Batch Plant Concrete Weight	2,012	tons/day
Days of Operation	80	days
Total Concrete Mass	160,960	tons
Storage Pile area	0.5	acres/day

^aConcrete density from AP-42, Section 11.12, Table 11.12-2, June 2006

It was assumed that the batch plant would operate at a rate of 1,000 yd3 per day for 80 days.

Construction On-Site Fugitive Dust from Soil Disturbance

Estimated Disturbed Acres - Option A

Activity	Acres Disturbed	Number of Days	Controlled PM10 Emission Factor (lb/acre/day)	Unmitigated Emissions (tons/yr)		Mitigated Emissions (tons/yr)	
				PM10	PM2.5	PM10	PM2.5
Access Road Construction	161	45	10	0.81	0.17	0.77	0.16
Foundation Construction	138	78	10	0.69	0.14	0.66	0.14
Collection System Construction	106	78	10	0.53	0.11	0.50	0.10
Substation/O&M Facility Construction	12	73	10	0.06	0.01	0.06	0.01
TOTAL (tons/yr)				2.08	0.43	1.98	0.41

Estimated Disturbed Acres - Option B

Activity	Acres Disturbed	Number of Days	Controlled PM10 Emission Factor (lb/acre/day)	Unmitigated Emissions (tons/yr)		Mitigated Emissions (tons/yr)	
				PM10	PM2.5	PM10	PM2.5
Access Road Construction	166	45	10	0.83	0.17	0.79	0.16
Foundation Construction	139	78	10	0.70	0.14	0.66	0.14
Collection System Construction	122	78	10	0.61	0.13	0.58	0.12
Substation/O&M Facility Construction	12	73	10	0.06	0.01	0.06	0.01
TOTAL (tons/yr)				2.19	0.46	2.08	0.43

1. Emission factor from URBEMIS2007. The controlled emission factor assumes the disturbed area is watered as part of the project BMPs (URBEMIS2007 User's Guide, Appendix A, November 2007).

2. The mitigated emissions assume an additional 5 percent reduction in emissions due to replacing ground cover in disturbed areas (from URBEMIS2007).

3. PM_{2.5} emission factors were calculated following the SCAQMD Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology, October 2006. For construction fugitive dust sources, it is assumed that 20.8% of the PM₁₀ would be PM_{2.5}.

Construction Off-Site Vehicles

Off-Site Vehicle Emissions

Construction Activity	Number of Vehicle Roundtrips	Vehicle Type	Miles Traveled per Roundtrip	Number of Days	Emissions (tons/yr)					Emissions (metric tons/yr)	
					ROG	CO	NOx	SOx	PM10	PM2.5	CO2
Bridge Access Option											
Embankment Material	435	Delivery Truck (diesel)	50	1	0.0157	0.0783	0.2951	0.0004	0.0279	0.0132	69
Concrete/Steel Pile Deliveries	10	Delivery Truck (diesel)	50	1	0.0004	0.0018	0.0068	0.0000	0.0006	0.0003	0.9
Concrete Trucks	46	Delivery Truck (diesel)	50	1	0.0017	0.0083	0.0312	0.0000	0.0029	0.0014	4
Reinforcing Steel	6	Delivery Truck (diesel)	50	1	0.0002	0.0011	0.0041	0.0000	0.0004	0.0002	0.5
Miscellaneous Delivery Trucks	12	Delivery Truck (diesel)	50	72	0.0311	0.1554	0.5861	0.0008	0.0553	0.0263	73
Construction Workers	30	Passenger car (construction workers)	50	72	0.0033	0.1864	0.0171	0.0004	0.0825	0.0175	31
Wind Facility											
Turbine Delivery	20	Turbine Delivery Truck (diesel)	50	100	0.0720	0.3598	1.3568	0.0018	0.1281	0.0608	170
Miscellaneous Delivery Trucks	12	Delivery Truck (diesel)	50	192	0.0829	0.4145	1.5630	0.0020	0.1476	0.0701	196
Water Delivery Trucks	25	Haul Truck (diesel)	50	192	0.1728	0.8635	3.2563	0.0042	0.3074	0.1460	408
Average Daily Construction Workers	80	Passenger car (construction workers)	50	192	0.0237	1.3257	0.1219	0.0025	0.5867	0.1244	219
				Total	0.3514	2.9635	6.2981	0.0106	1.1697	0.4014	993

Note: PM10 and PM2.5 emissions include exhaust emissions and paved road dust emissions.

1. The number of vehicles, vehicle type, miles traveled, and number of days provided by TGP.
2. For the bridge access option, the number of days for embankment material, pile deliveries, concrete, and steel truck trips was set equal to one because the total number of trips would be 10, 46, and 6, respectively. For the miscellaneous truck trips and workers, the number of days represents the total number of days for construction, assuming these trips would occur each day.
3. It was assumed that trucks would be needed throughout the wind facility construction duration to deliver items such as gravel, equipment, and other materials. It assumed the deliveries would occur at a rate of 12 trips per day (12 trucks making 1 roundtrip per day with a roundtrip distance of 50 miles).
4. It was assumed that trucks would be needed throughout the wind facility construction duration to deliver water at a rate of 25 trips per day (5 trucks making 5 roundtrips per day with a roundtrip distance of 50 miles).
5. For construction workers, the average daily number of workers would be 80 per day over the duration of wind facility construction (80 average workers x 1 roundtrip per day).

Emission Factors:
Exhaust Emission Factors

Vehicle	Vehicle Type in EMFAC2007	2012 Emission Factors (lb/mile)						
		ROG	CO	NOx	SOx	PM10	PM2.5	CO2
On-site Trucks (haul, concrete)	Heavy-Heavy Duty Diesel Truck	0.0130	0.0273	0.0512	0.0007	0.0034	0.0031	6.9785
Off-site Trucks (delivery, water)	Heavy-Heavy Duty Diesel Truck	0.0014	0.0072	0.0271	0.0000	0.0011	0.0009	3.7501
On-site Trucks (work truck)	Light-Duty Truck, Gasoline	0.0004	0.0093	0.0007	0.00002	0.0001	0.0001	1.9712
Employee Commute	Passenger Vehicles, Gasoline	0.0001	0.0035	0.0003	0.00001	0.0001	0.00003	0.6290
2012 Emission Factors (g/mile)								
Vehicle	Vehicle Type in EMFAC2007	ROG	CO	NOx	SOx	PM10	PM2.5	CO2
On-site Trucks (haul, concrete)	Heavy-Heavy Duty Diesel Truck	5.886	12.373	23.236	0.030	1.553	1.391	3165.447
Off-site Trucks (delivery, water)	Heavy-Heavy Duty Diesel Truck	0.653	3.264	12.309	0.016	0.498	0.42	1701.031
On-site Trucks (work truck)	Light-Duty Truck, Gasoline	0.191	4.198	0.323	0.009	0.064	0.047	894.149
Employee Commute	Passenger Vehicles, Gasoline	0.028	1.566	0.144	0.003	0.029	0.015	285.302

EFs from the California Air Resources Board's EMFAC 2007 model for Kern County. It was assumed that on-site trucks would travel at 10 mph, off-site trucks would travel 45 mph and employees would travel at 45 mph. It was assumed all vehicles would be model year 2000 or newer.

Calculation of Paved Road Emission Factor

Paved Roads emission factor from AP-42, Section 13.2.1: Paved Roads (11/06)

$$E = [k(SL/2)^{0.65} (W/3)^{1.5}] - C$$

where:

	PM10	PM2.5
k =	7.3	1.1
SL =	0.03	0.03
W =	5	5
C =	0.2119	0.1617
$E_{(PM10/2.5)}$ =	0.664	0.132

particle size multiplier, g/VMT [Table 13.2.1-1]
road surface silt loading (g/m²) [Table 13.2.1-3, for Ubiquitous Baseline Roadway with ADT >10,000]
tons [Average vehicle weight, assumes truck weight = 17 tons and construction worker vehicle weight = 2 tons]
emission factor for 1980's vehicle fleet exhaust, brake wear, and tire wear, g/VMT [Table 13.2.1-2 for PM₁₀]
g/VMT

Calculation of Unpaved Road Emission Factor**PM10**Emission Factor [lb/mi] = $1.5 \times (\text{silt content } [\%] / 12)^{0.9} \times (\text{average vehicle weight [tons]} / 3)^{0.45} \times (365 \cdot P) / 365$

Reference: AP-42, Section 13.2.2, November 2006

Parameter	Value
Average Vehicle Weight (tons)	6
Silt Content (%)	8.5
P, Number of days with Precip >0.01 inches	22
Emission Factor (Uncontrolled, lb/mile)	1.42
Reduction from Watering 3 times/Day	61%
Controlled Emission Factor (lb/mile)	0.56

Average vehicle weight assumes that the weighted average truck weights are haul truck weight=15 tons and pickup/work truck weight = 3 tons and is weighted based on the miles traveled onsite by each truck type.

Reference for Silt Content: AP-42, Section 13.2.2, Table 13.2.2-1, Average for a Construction Site, Scraper Route

Reference for Precipitation: WRCC, Mojave, CA, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5756>

Reference for Control Efficiency: URBEMIS2007, assumed watering 3 times per day as part of project BMPs.

PM2.5Emission Factor [lb/mi] = $0.15 \times (\text{silt content } [\%] / 12)^{0.9} \times (\text{average vehicle weight [tons]} / 3)^{0.45} \times (365 \cdot P) / 365$

Reference: AP-42, Section 13.2.2, November 2006

Parameter	PM _{2.5}
Average Vehicle Weight (tons)	6
Silt Content (%)	8.5
P, Number of days with Precip >0.01 inches	22
Emission Factor (Uncontrolled, lb/mile)	0.14
Reduction from Watering 3 times/Day	61%
Controlled Emission Factor (lb/mile)	0.06

Average vehicle weight assumes that the weighted average truck weights are haul truck weight=15 tons and pickup/work truck weight = 3 tons and is weighted based on the miles traveled onsite by each truck type.

Reference for Silt Content: AP-42, Section 13.2.2, Table 13.2.2-1, Average for a Construction Site, Scraper Route

Reference for Precipitation: WRCC, Mojave, CA, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5756>

Reference for Control Efficiency: URBEMIS2007, assumed watering 3 times per day as part of project BMPs.

URBEMIS2007 Explanation of Phasing

Due to the way URBEMIS2007 was designed, it is not possible to assign the same construction phase type during the same time period.

Therefore, in order to represent the different construction activities associated with the project, construction phases were assigned in URBEMIS2007 that do not necessarily match the project construction activity.

The table below summarizes the association of the project construction activity with the phase used in URBEMIS2007.

Correlation of Project Construction Activity with Construction Phase in URBEMIS2007

Project Phase Duration	Project Phase Name	URBEMIS Phase Name
2/1/2012 - 4/30/2012	Bridge Option	Trenching
5/1/2012 - 6/11/2012	Site Preparation/Road Construction	Mass Site Grading
5/15/2012 - 8/6/2012	Foundation Construction	Fine Site Grading
6/19/2012 - 8/27/2012	Electrical Collection System Construction	Trenching
6/26/2012 - 9/3/2012	Construct Substation/O&M Building	Demolition
6/12/2012 - 9/3/2012	Transmission Line Construction	Paving
8/1/2012 - 12/3/2012	WTG Construction	Building Construction
11/20/2012 - 12/31/2012	Site Cleanup/Restoration	Fine Site Grading

URBEMIS2007 results designated as "mitigated" represent implementation of the BMP that construction equipment will be equipped with engines meeting Tier 3 emission standards rather than implementation of a mitigation measure.

4/26/2011 01:00:13 PM

Urbemis 2007 Version 9.2.4

Detail Report for Annual Construction Mitigated Emissions (Tons/Year)

File Name: C:\Projects\Alta\AltaEast\Comments-County\Update for Bridge\AltaEast_Unmitigated_042611.urb924

Project Name: Alta East Wind Project

Project Location: Kern County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

	COG	NOx	CQ	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2
2012											
Trenching 02/01/2012-04/30/2012	4.24	23.47	17.94	0.00	0.01	1.76	1.77	0.00	1.62	1.62	4,564.98
Trenching Off Road Diesel	0.40	2.08	1.69	0.00	0.00	0.15	0.15	0.00	0.14	0.14	410.05
Trenching Worker Trips	0.39	2.07	1.58	0.00	0.00	0.15	0.15	0.00	0.14	0.14	398.22
Mass Grading 05/01/2012-	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.82
Mass Grading Dust	0.30	1.42	1.33	0.00	0.00	0.12	0.12	0.00	0.11	0.11	259.16
Mass Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading On Road Diesel	0.30	1.41	1.23	0.00	0.00	0.12	0.12	0.00	0.11	0.11	247.65
Mass Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 05/15/2012-	0.69	3.88	3.06	0.00	0.00	0.28	0.28	0.00	0.26	0.26	11.52
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.68	3.87	2.83	0.00	0.00	0.28	0.28	0.00	0.26	0.26	750.30
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	724.50
Asphalt 06/11/2012-09/03/2012	0.70	3.89	3.02	0.00	0.00	0.28	0.28	0.00	0.26	0.26	0.00
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.80
Paving Off Road Diesel	0.69	3.87	2.73	0.00	0.00	0.28	0.28	0.00	0.26	0.26	850.87
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Worker Trips	0.01	0.01	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 06/19/2012-08/27/2012	0.31	1.66	1.38	0.00	0.00	0.13	0.13	0.00	0.12	0.12	819.11
Trenching Off Road Diesel	0.30	1.65	1.24	0.00	0.00	0.13	0.13	0.00	0.12	0.12	0.00
Trenching Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	271.69
Demolition 06/26/2012-09/03/2012	0.43	2.08	1.92	0.00	0.00	0.19	0.19	0.00	0.18	0.18	16.12
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	438.88
Demo Off Road Diesel	0.42	2.07	1.71	0.00	0.00	0.19	0.19	0.00	0.18	0.18	0.00
Demo On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	415.08
Demo Worker Trips	0.01	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building 08/01/2012-12/03/2012	1.28	7.85	4.90	0.00	0.00	0.54	0.54	0.00	0.50	0.50	23.80
Building Off Road Diesel	1.28	7.85	4.90	0.00	0.00	0.54	0.54	0.00	0.50	0.50	1,557.88
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 11/20/2012-	0.14	0.61	0.64	0.00	0.00	0.06	0.06	0.00	0.06	0.06	0.00
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.03
Fine Grading Off Road Diesel	0.14	0.60	0.57	0.00	0.00	0.06	0.06	0.00	0.06	0.06	0.00
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	102.66
Fine Grading Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Demolition 6/26/2012 - 9/3/2012 - Substation/Office Construction

For Aerial Lifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Bore/Drill Rigs, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Cranes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Excavators, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Generator Sets, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Graders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Plate Compactors, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rollers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Trenchers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Welders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

The following mitigation measures apply to Phase: Fine Grading 5/15/2012 - 8/6/2012 - Foundation Construction

For Cranes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Excavators, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Generator Sets, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Pumps, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rollers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Welders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

The following mitigation measures apply to Phase: Fine Grading 11/20/2012 - 12/31/2012 - Site Cleanup/Restoration

For Crawler Tractors, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Graders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Plate Compactors, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rollers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Skid Steer Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

The following mitigation measures apply to Phase: Mass Grading 5/1/2012 - 6/11/2012 - Site Preparation/Road Construction

For Excavators, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%

For Scrapers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Skid Steer Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Crawler Tractors, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Dumpers/Tenders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rollers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Graders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
The following mitigation measures apply to Phase: Trenching 6/19/2012 - 8/27/2012 - Electrical Collection System Construction
For Excavators, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Plate Compactors, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rubber Tired Dozers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rubber Tired Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Skid Steer Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Trenchers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%
The following mitigation measures apply to Phase: Trenching 2/1/2012 - 4/30/2012 - Bridge Option
For Excavators, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Bore/Drill Rigs, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Cranes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Scrapers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rubber Tired Dozers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rollers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
The following mitigation measures apply to Phase: Paving 6/11/2012 - 9/3/2012 - T-line Construction
For Aerial Lifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Bore/Drill Rigs, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Cranes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Dumpers/Tenders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Excavators, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Generator Sets, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Graders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Other Equipment, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rubber Tired Dozers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rubber Tired Loaders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:

NOX: 40%
For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Welders, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Water Trucks, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
The following mitigation measures apply to Phase: Building Construction 8/1/2012 - 12/3/2012 - WTG Installation
For Air Compressors, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Cranes, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Generator Sets, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Pressure Washers, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%
For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 40% mitigation reduces emissions by:
NOX: 40%

Phase Assumptions

Phase: Demolition 6/26/2012 - 9/3/2012 - Substation/Office Construction
Building Volume Total (cubic feet): 0
Building Volume Daily (cubic feet): 0
On Road Truck Travel (VMT): 0
Off-Road Equipment:
4 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day
1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
4 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day
1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
3 Generator Sets (310 hp) operating at a 0.74 load factor for 8 hours per day
1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
2 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day
1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day
6 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day
2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 5/15/2012 - 8/6/2012 - Foundation Construction

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

6 Generator Sets (310 hp) operating at a 0.74 load factor for 8 hours per day

2 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

2 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 11/20/2012 - 12/31/2012 - Site Cleanup/Restoration

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

2 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day

2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

3 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 5/1/2012 - 6/11/2012 - Site Preparation/Road Construction

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

2 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day

2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

3 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

- 1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
- 2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
- 2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
- 2 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day
- 2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
- 5 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 6/19/2012 - 8/27/2012 - Electrical Collection System Construction

Off-Road Equipment:

- 2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 4 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
- 4 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day
- 2 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
- 1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
- 1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day
- 2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
- 2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day
- 2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/1/2012 - 4/30/2012 - Bridge Option

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
- 1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day
- 1 Excavators (168 hp) operating at a 0.57 load factor for 4 hours per day
- 2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 4 hours per day
- 4 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 2 hours per day
- 1 Water Trucks (189 hp) operating at a 0.5 load factor for 1 hours per day

Phase: Paving 6/11/2012 - 9/3/2012 - T-line Construction

Acres to be Paved: 0

Off-Road Equipment:

- 4 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day
- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
- 4 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
- 2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day
- 1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 4 Generator Sets (310 hp) operating at a 0.74 load factor for 8 hours per day
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 6 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
- 4 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
- 1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
- 2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
- 1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day
- 2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 8/1/2012 - 12/3/2012 - WTG Installation

Off-Road Equipment:

- 2 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day
- 2 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day
- 2 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day
- 10 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
- 10 Generator Sets (310 hp) operating at a 0.74 load factor for 8 hours per day
- 4 Pressure Washers (1 hp) operating at a 0.6 load factor for 8 hours per day
- 10 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
- 1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Operation Emissions

Summary

Emission Source	Emissions (tons/year)						Emissions (metric tons/year)	
	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}	CO ₂	CO ₂ e
Vehicle and Equipment Emissions	0.25	1.10	1.53	0.003	4.67	0.54	261	275
Emergency Propane Generators	0.72	0.82	0.33	0.03	0.02	0.02	39	41
Total (ton/yr)	1.0	1.9	1.9	0.03	4.7	0.6	300	316
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE	NE
Threshold Exceeded?	No	NA	No	NA	No	NA	NA	NA

1. According to the Cummins Emission Data sheet, particulate matter emissions from the propane generator would be negligible.

2. CH₄ and N₂O from combustion sources would be much lower than emissions of CO₂, contributing in the range of 2 to 4 percent of the CO₂e emissions. Therefore, it was assumed that CH₄ and N₂O emissions account for 5 percent of the CO₂e emissions so the CO₂ emissions were multiplied by 100/95 to calculate CO₂e emissions.

NA = Not applicable

NE = Threshold has not been established

Vehicle Emissions

Emission Source	Number per Day	Days per Year	Roundtrip Vehicle Miles Traveled per Day	Emissions (tons/year)						Emissions (metric tons/year)
				ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}	
Maintenance Trucks	4	365	20	0.19	0.40	0.75	0.00	4.60	0.50	92
Delivery Trucks	1	260	150	0.03	0.14	0.53	0.00	0.05	0.02	66
Employee Commute	15	365	50	0.01	0.47	0.04	0.00	0.01	0.00	78
TOTAL (tons/year)				0.23	1.01	1.32	0.00	4.66	0.53	237

1. Maintenance truck PM₁₀ and PM_{2.5} emissions include unpaved road dust emissions.

2. Delivery truck and employee commute PM₁₀ and PM_{2.5} emissions include paved road dust emissions.

Equipment Used for Periodic Maintenance

Emission Source	Number per Day	Hours per Day	Days per Year	Emissions (tons/year)						Emissions (metric tons/year)
				ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}	
Crane	2	8	30	0.0192	0.0653	0.1755	0.0002	0.0064	0.0058	20.142
Forklift	2	8	30	0.0040	0.0232	0.0296	0.0000	0.0017	0.0016	3.563
Grader	1	8	2	0.0008	0.0039	0.0059	0.0000	0.0003	0.0003	0.5892
TOTAL (tons/year)				0.0239	0.0923	0.2110	0.0002	0.0084	0.0077	24.2947

Equipment Emission Factors

Emission Source	Horsepower	Load Factor	Emission Factors (g/bhp hr)				
			ROG	CO	NOx	SOx	CO ₂
Crane	399	0.43	0.211	0.719	1.933	0.002	0.070
Forklift	145	0.30	0.173	1.006	1.287	0.002	0.074
Grader	174	0.61	0.411	2.057	3.134	0.004	0.163
							0.643
							346.974

1. Horsepower, load factors and emission factors from the URBEMIS2007 for Windows Users' Guide, Appendix G and I – Construction Equipment Emission Factors.

Stationary Source Emissions

Emission Source	Horsepower	Hours per Year	Emission Limits (tons/year)					Emissions (metric tons/year)
			ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}
60 kW Emergency Propane Generator at Substation	113	200	0.67	0.67	0.24	0.01	0.01	0.01
140 kW Emergency Propane Generator at Control Building	210	200	0.05	0.15	0.09	0.02	0.01	0.01

1. The propane generator horsepower, hours per year, and emission limits are based on the generator permit authorities to construct issued by EKAPCD for another Alta Wind, LLC project. It is assumed similar generators would be used for this project.

2. CO2 emissions were estimated based on anticipated fuel consumption.

605 Fuel consumption (scfh)

Based on Cummins generator data sheet set with engine at full load.

3. The propane CO2 emission factor of 63.02 kg CO2/MMBtu from the California Air Resources Board, Mandatory GHG Reporting Regulation, Appendix A and a heat content of 2,570 Btu/scf were used to estimate CO2 emissions.

Emission Reductions

Annual Energy Generated (MWh): 762,120

This assumes 300 MW x 8,760 hours per year x 29% capacity factor

Conversion Factor: 3,413 Btu/kWh

Potential Emissions Reduced from Displacement of Natural Gas Generated Electricity

Emission Source	Emission Factor (lbs /MMBtu)		Emission Factor (lbs /MWh)	Potential Emission Benefit (tons/yr, metric tons/yr for CO2)	
	NOx	PM ₁₀		NOx	PM ₁₀
In-State Electricity Generation	0.099	0.0066	963	129	9
					332,902

The NOx and PM10 emission factors from AP-42, Chapter 3.1, Stationary Gas Turbines, assuming lean premix for NOx and uncontrolled for PM.

The CO2 emission factor is from the California Air Resources Board Scoping Plan, Appendix I, December 2008.

Appendix C

Appendix C

Technical Memorandum: Alta East Wind Project

General Conformity Applicability Analysis

Alta East Wind Project General Conformity Applicability Analysis

PREPARED FOR: Alta Windpower Development, LLC /CH2M HILL

DATE: April 27, 2011

The purpose of this memorandum is to evaluate whether a general conformity determination would be required for the Alta East Wind Project (project). The project is proposed to be located on approximately 3,200 acres in southeastern Kern County, California. Construction of the project would occur in the year 2012, with the project becoming operational by the end of 2012. Approximately 64 percent of the project's area would be located on land managed by the Bureau of Land Management (BLM), and approximately 70-75 percent of the wind turbine generators (WTGs) would be located on land managed by BLM. Since the project will include approval by a federal agency, BLM, and is located in a federal nonattainment area for ozone, a review of general conformity applicability is required. The applicability analysis below demonstrates that the project would not contribute to a violation of a National Ambient Air Quality Standard (NAAQS), so a conformity determination would not be required.

General Conformity Applicability Analysis

Federal air quality policies are regulated through the Clean Air Act (CAA). The General Conformity rule was established under Section 176(c) of the CAA and ensures that federal actions in nonattainment and maintenance areas meet the federal air quality standards. Nonattainment areas are areas, such as counties, that the United States Environmental Protection Agency (EPA) has designated as not complying with the NAAQS. Maintenance areas are areas that have been redesignated to attainment status and must have a 10-year plan for maintaining the ambient air quality standards.

The EPA Conformity Rule requires all federal agencies to ensure that any federal action in nonattainment or maintenance areas conform to an approved or promulgated state or federal implementation plan. Conformity means compliance with the purpose of attaining or maintaining the NAAQS. Specifically, this means ensuring that the federal action will not: (1) cause a new violation of the NAAQS, (2) contribute to any increase in the frequency or severity of violations of existing NAAQS, or (3) delay the timely attainment of any NAAQS interim or other attainment milestones.

Attainment Status and De Minimis Emission Rates

As stated above, general conformity applies in federally designated nonattainment and maintenance areas, such as Kern County, where the project is located. General conformity requires that total emissions of criteria pollutants for areas designated as nonattainment or maintenance, including ozone precursors (reactive organic compounds [ROGs] and nitrogen oxides [NO_x]), be considered in determining conformity applicability. Since the project is

located in a nonattainment area for ozone (former subpart 1)¹, emissions of ozone precursors, ROG and NOx, and the general conformity *de minimis* threshold of 100 tons per year were used to evaluate applicability. If a project meets the following requirement, a conformity determination is not required [per 40 CFR 93.153(c)]:

- The total direct and indirect emissions in a nonattainment or maintenance area are less than the applicable *de minimis* thresholds established in 40 CFR 93.153(b).

Total direct and indirect emissions are evaluated by comparison of project emissions to the emissions from the No Action Alternative. It was assumed the No Action Alternative would be continuation of the existing land uses. Therefore, NOx and ROG emissions resulting from construction or operation of the project were evaluated.

Methodology

The methodology used to estimate construction and operation emissions is summarized in the *Air Quality and Greenhouse Gas Technical Report for the Alta Wind Project*². Annual construction emissions were estimated for construction equipment, construction vehicles, and fugitive dust. Construction equipment emissions were estimated using emission factors from the URBEMIS2007 model. Construction vehicle emissions were estimated using emission factors from the California Air Resources Board (ARB) EMFAC2007 model, and fugitive dust emissions were estimated using an emission factors from EPA's AP-42 and URBEMIS2007. Although a portion of the construction activities would occur on BLM land, it was conservatively assumed that 100% of the construction emissions would occur on BLM land. The annual NOx and ROG emissions in units of tons per year were compared to the conformity *de minimis* threshold of 100 tons per year to evaluate whether a conformity determination would be needed.

Results

Peak emissions from the project would result from construction in the year 2012. As shown in Table 1, the peak annual emissions would be less than the general conformity *de minimis* thresholds.

TABLE 1. PEAK ANNUAL EMISSIONS

Emission Source	NOx Emissions (tons/year)	ROG Emissions (tons/yr)
Construction	33	5
<i>De Minimis</i> Threshold	100	100

Conclusion

The peak calendar year emissions would be less than the *de minimis* thresholds, therefore, the project does not require a conformity determination.

¹ According to 74 FR 2935. Implementation of the 1997 8-Hr Ozone NAAQS: Classification of Subpart 1 Areas and Revision to Anti-Backsliding Provisions; Deletion of Obsolete 1-Hr Ozone Standard Provisions, the proposed designation for Kern County is moderate nonattainment.

² CH2MHILL, 2011. *Air Quality and Greenhouse Gas Technical Report for the Alta Wind Project*

Revised Emission Summary

Summary of Mitigated Construction Emissions - Alternative. A

Emission Source	Emissions (tons/yr)						Emissions (metric tons)	
	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CO2e
Wind Facility								
Onsite Equipment	3.84	16.25	21.39	0.001	1.61	1.49	3,859	4,062
Onsite Vehicles	0.68	1.83	2.65	0.004	0.18	0.15	407	428
Onsite Concrete Batch Plant	NA	NA	NA	NA	1.90	0.70	NA	NA
Onsite Fugitive Dust (land disturbance and unpaved roads)	NA	NA	NA	NA	32.40	3.45	NA	NA
Offsite Vehicles	0.35	2.96	6.30	0.011	1.40	0.50	993	1,046
Total - Wind Facility	4.88	21.04	30.34	0.02	37.51	6.29	5,260	5,536
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE	NE
Threshold Exceeded?	No	NA	Yes	NA	Yes	NA	NA	NA

Note: Emissions of ROG, CO, NOx, CO2, and CO2e are estimated by the applicant. Since the applicant estimated fugitive dust emissions generated from vehicle trips on paved road using the formula in the old AP-42, Aspen revised these emissions using the latest AP-42 as appears on Page 2.

NA = Not applicable

NE = Threshold has not been established

Summary of Mitigated Operation Emissions - Alternative. A

Emission Source	Emissions (tons/year)						Emissions (metric tons/year)	
	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}	CO2	CO2e
Vehicle Emissions	0.23	1.01	1.32	0.00	4.91	0.59	237	249
Equipment Emissions	0.02	0.09	0.21	0.00	0.01	0.01	24	26
Emergency Propane Generators	0.72	0.82	0.33	0.03	0.02	0.02	39	41
Total (ton/yr)	0.97	1.92	1.86	0.03	4.94	0.62	300	316
EKAPCD Thresholds	25	NE	25	NE	15	NE	NE	NE
Threshold Exceeded?	No	NA	No	NA	No	NA	NA	NA

Construction - Paved Road Fugitive Dust Emissions

Emission Factors:

Calculation of Paved Road Emission Factor

Paved Roads emission factor from AP-42, Section 13.2.1: *Paved Roads* (1/11)

$$E = [k \times (sL)^{0.91} \times (W)^{1.02}] \times (1-P/4N)$$

$$E = \text{lb/VMT}$$

k = Constant (0.0022 for PM10 and 0.00054 for PM2.5)

sL = Silt Loading (assumed to be 0.06 g/m² for 5,000<ADT<10,000 of Table 13.2.1-2)

W = Average weight of vehicles in tons (calculated below)

No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions

Passenger Vehicles = 2 tons average

Midsized "Delivery" Vehicles = 8 ton average

Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/ Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
Wind Facility	768,000	115,200	340,000	1,223,200	10.3

Note: Annual VMT are estimated by the applicant.

Annual Emission Factors (lb/VMT)

	PM10 Annual	PM2.5 Annual
Wind Facility	0.0018	0.0005

	PM10 (g/VMT)	PM2.5 (g/VMT)
$E_{(PM10/2.5)}$	0.836	0.205

Off-Site Vehicle Emissions

Construction Activity	Number of Vehicle Roundtrips	Vehicle Type	Miles Traveled per Roundtrip	Number of Days	Emissions (tons/yr)	
					PM10	PM2.5
Turbine Delivery						
Exhaust	20	Turbine Delivery Truck (diesel)	50	100	0.0549	0.0463
Fugitive Dust	20	Turbine Delivery Truck (diesel)	50	100	0.0922	0.0226
Miscellaneous Delivery Trucks						
Exhaust	12	Delivery Truck (diesel)	50	192	0.0632	0.0533
Fugitive Dust	12	Delivery Truck (diesel)	50	192	0.1062	0.0261
Water Delivery Trucks						
Exhaust	25	Haul Truck (diesel)	50	192	0.1317	0.1111
Fugitive Dust	25	Haul Truck (diesel)	50	192	0.2212	0.0543
Average Daily Construction Workers						
Exhaust	80	Passenger car (construction workers)	50	192	0.0246	0.0127
Fugitive Dust	80	Passenger car (construction workers)	50	192	0.7080	0.1738
Total					1.4020	0.5002

Note: Exhaust emissions are unchanged but presented to show the total PM10 and PM2.5 emissions from offsite vehicle travel. Fugitive dust emissions are calculated based on the emission factors calculated using the latest AP-42 as presented above.

Operation - Paved Road Fugitive Dust Emissions

Vehicle Emissions

Emission Source	Number per Day	Days per Year	Roundtrip Vehicle Miles Traveled per Day	Emissions (tons/year)	
				PM ₁₀	PM _{2.5}
Delivery Trucks					
Exhaust	1	260	150	0.02	0.02
Fugitive Dust	1	260	150	0.04	0.01
Employee Commute					
Exhaust	15	365	50	0.01	0.00
Fugitive Dust	15	365	50	0.25	0.06
TOTAL (tons/year)				0.32	0.09

Note: As Aspen revised the emission factors for vehicle trips on paved road, Aspen also revised fugitive dust emissions generated from delivery trucks during operation using the emission factors presetned on page 2. Exhaust emissions from delivery trucks are unchanged. Aspen estimated fugitive dust emissions from employee commute based on the emission factors presented on page 2 as the applicant omitted fugitive dust emissions from employee cummuting trips.

Appendix H

Traffic Impact Analysis

Traffic Analysis for the Alta East Wind Project

PREPARED FOR: Alta Windpower Development, LLC

PREPARED BY: CH2M HILL

DATE: Revised April 21, 2011

Project Summary

Alta Windpower Development, LLC (AWD), proposes to construct the Alta East Wind Project (project) in southeastern Kern County, California. The wind energy facility would include up to 120 wind turbine generators capable of generating up to 360 megawatts of power. The project would be located on approximately 3,200 acres on the north and south sides of State Route 58 (SR 58), approximately 3 miles northwest of the town of Mojave and approximately 11 miles east of the city of Tehachapi. The location of the project site is shown in Figure 1, Regional Vicinity Map (provided to Kern County on February 15, 2011).

Two options, Options A and B, have been identified for the turbine layout on the project site. One turbine layout will ultimately be selected during final design and constructed. A portion of the project site would be located on privately owned land, and the remainder would be on federal land managed by the U.S. Bureau of Land Management.

There are currently two options for access to project site during construction and operation. One option includes accessing the site from the west through the operating Cameron Ridge project, owned by an affiliate of AWD. A second option, currently under development, for access to the site includes construction of a bridge across the Los Angeles Aqueduct in Section 32S 35E 35. The proposed route to the bridge and the bridge design is currently being discussed with the Los Angeles Department of Water and Power (LADWP) and Kern County. The bridge would be accessed from two possible routes, via a paved access road from Oak Creek Road along the preferred transmission route, or via Holt Street (or another similar street), which would be extended past its current limits. AWD is currently in discussions with Kern County on access routes to the bridge. At this time, no figure is available to illustrate these possible routes. A figure will be provided, once available.

Project construction is scheduled to begin in spring 2012 and would be completed by the end of December 2012. This technical memorandum summarizes anticipated traffic due to construction and operation of the wind facility, and associated on-site project components.

Thresholds of Significance

The Kern County CEQA Implementation Document and the Kern County Environmental Checklist provide seven significance criteria for evaluating a project's impact on transportation and traffic. Specifically, will the project:

1. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

2. Exceed, either individually or cumulatively, a Level of Service (LOS) standard established by the county congestion management agency or adopted County threshold for designated roads or highways? Specifically, would implementation of the project cause the LOS for roadways and/or intersections to decline below the following thresholds or further degrade already degraded segment(s):
 - i. Metropolitan Bakersfield General Plan LOS "C"?
 - ii. Kern County General Plan LOS "D"?
3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?
4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
5. Result in inadequate emergency access?
6. Result in inadequate parking capacity?
7. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

The project is not expected to impact air traffic patterns. It will not include any changes or improvements to existing public roadways or the creation of new public roadways that may include dangerous design features. The project will comply with all applicable emergency access and parking standards.

The project may have potentially significant impacts to existing traffic and LOS on roadways in the project vicinity. These two areas of potential impact are discussed in further detail below.

Level of Service Concept

LOS is an indicator of operating conditions on a roadway or at an intersection and is defined in categories ranging from A to F; LOS A represents the best traffic flow conditions, and LOS F represents poor conditions. In other words, LOS A indicates free-flowing traffic, and LOS F indicates substantial congestion with stop-and-go traffic and long delays at intersections. Table 1 provides the LOS criteria and characteristics for multilane highways.

TABLE 1
Level of Service Descriptions

LOS	V/C*	Characteristics
A	Up to 0.30	Free-flow operation exists.
B	0.31-0.49	Reasonably free-flow operation exists; the ability to maneuver within the traffic stream is only slightly restricted.
C	0.50-0.70	Travel speeds are still at or near free-flow, but the ability to maneuver within the traffic stream is noticeably restricted.
D	0.71-0.90	Travel speeds begin to decline with increasing flows; the ability to maneuver is more noticeably limited; and minor incidents can be expected to create queuing.

E	0.91- 1.00	Operation is at or near capacity and is therefore volatile because virtually no useable gaps in the traffic stream appear; maneuverability is extremely limited; and any disruption to the traffic stream, such as vehicles entering from ramps or changing lanes, can cause disruptions.
F	Greater than 1.00	Breakdown in vehicular flow occurs, with queues forming behind major breakdown points, such as traffic incidents or recurring points of congestion.

*Volume to capacity ratio of the facility, per Highway Capacity Manual 2000, Exhibit 21-2

According to the Kern County General Plan Circulation Element, the county strives to maintain a minimum LOS D for all county-maintained roads and LOS C for Caltrans facilities; except for SR 58 between Interstate 5 (I-5) and the east end of Bakersfield, where LOS D would be acceptable.¹

Existing Traffic Conditions

The project site and vicinity is served by SR 58 and State Route 14 (SR 14). SR 58 has two or four lanes (one or two in each direction). It runs east-west and begins in San Luis Obispo County. SR 58 enters Kern County near the city of McKittrick and then runs east through the cities of Bakersfield and Mojave to the Kern County boundary, past the city of Boron, to end in San Bernardino County. SR 14 has two or four lanes. It runs north-south and begins at I-5 just north of the San Fernando Valley. SR 14 continues north into Kern County, where it ends at State Route 395, north of the city of Inyokern. Table 2 is a summary of the characteristics of the roadway segments studied along SR 58 and SR 14. All roadway segments studied currently operate at acceptable LOS.

Project-related traffic would use SR 58 and Oak Creek Road. Project-related traffic would travel along Oak Creek Road to a point south or southwest of the project site and then turn off Oak Creek Road to the north, thereafter accessing the project on roads from the west or east. While two options for site access to the project site have been identified, only one will ultimately be selected during final design and utilized during construction.

¹ Kern County. 2007. *General Plan, Circulation Element*. [online]: <http://www.co.kern.ca.us/planning/pdfs/kcgp/KCGPChp2Circulation.pdf>. Accessed February 14, 2011.

TABLE 2
Existing Conditions Traffic Operations Summary

Roadway ¹	Segment Between	Median	Number of Lanes ²	Peak Hour Capacity per Lane ³	2-Way AADT (2009) ⁴	Peak Hour Volume ⁵ (2009)	V/C Ratio	LOS
SR 58 EB	Fairfax Road and SR 184	Divided	3	1800	36000	2535	0.47	B
SR 58 WB	Fairfax Road and SR 184	Divided	3	1800	36000	2975	0.55	C
SR 58 EB	SR 184 and Edison Road	Divided	2	1800	25000	1768	0.49	B
SR 58 WB	SR 184 and Edison Road	Divided	2	1800	25000	2075	0.58	C
SR 58 EB	SR 202 and Mill Street	Divided	2	1800	20900	1868	0.52	C
SR 58 WB	SR 202 and Mill Street	Divided	2	1800	20900	2192	0.61	C
SR-58 EB	Randsburg Cut-Off Road and SR 14	Divided	2	1800	14050	1034	0.29	A
SR-58 WB	Randsburg Cut-Off Road and SR 14	Divided	2	1800	14050	1214	0.34	B
SR 14 NB	Silver Queen Road and SR 58	Divided	2	1800	18300	1311	0.36	B
SR 14 SB	Silver Queen Road and SR 58	Divided	2	1800	18300	874	0.24	A
SR 14 NB	Rosamond Boulevard and Silver Queen Road	Divided	2	1800	17600	1380	0.38	B
SR 14 SB	Rosamond Boulevard and Silver Queen Road	Divided	2	1800	17600	920	0.26	A
SR 14 NB	County Line and Rosamond Boulevard	Divided	2	1800	31000	1967	0.55	C
SR 14 SB	County Line and Rosamond Boulevard	Divided	2	1800	31000	1311	0.36	B

Notes:

¹EB/WB/NB/SB: eastbound/westbound/northbound/southbound

²per direction

³passenger cars/hour/lane

⁴vehicles/hour

⁵Total passenger cars/hour. Directional factors found in Caltrans District 9 Transportation Concept Report (2004) were applied to the 2009 two-way peak hour volumes provided by Caltrans to calculate the volume on the peak direction of travel. The raw peak hour volumes were also modified to reflect the effect of truck traffic (30% on SR 58 and 10% on SR 14, based Caltrans data). Truck trips were converted to passenger car by applying a Passenger Car Equivalent factor of 1.5.

Sources:

California Department of Transportation. 2009 Traffic Volumes for State Highway 58. [online]: <http://traffic-counts.dot.ca.gov/2009all/Route51-59i.htm>. Accessed March 18, 2011.

California Department of Transportation. 2009 Traffic Volumes for State Highway 14. [online]: <http://traffic-counts.dot.ca.gov/2009all/Route12-15i.htm>. Accessed March 18, 2011.

Expected Construction and Operation Traffic

A summary of the expected project traffic volumes was prepared based on information provided by AWD. Anticipated traffic for both peak project construction and operation were identified using a conservative estimate of traffic operations that will occur during the life cycle of the proposed project.

Project Construction Traffic

Construction of the proposed wind project will take approximately 9 to 12 months. In addition to vehicle trips generated by construction workers traveling to the site, project construction would add vehicle trips to the area's roadway system due to construction equipment and material deliveries. Delivery of construction materials would require a number of oversized-vehicle trips. Oversized vehicles may travel at slower speeds than existing traffic and, due to their size, may intrude into adjacent travel lanes (in all cases using road permits). These oversized-vehicle trips may temporarily affect operations on area freeways, roadways, and intersections. Additionally, the additional vehicle trips associated with all construction-related traffic (including construction workers) will temporarily increase daily traffic volumes on local roadways and intersections. Finally, stringing activities required for transmission line infrastructure across Oak Creek Road may require temporary lane closures that may result in temporary traffic delays on affected roadways.

Project construction is expected to require an average of approximately 80 onsite construction workers with a peak of approximately 262 workers (includes construction workers, management, and staff). The peak of 262 workers is anticipated to occur for three weeks during the 9 to 12 month construction period, but is used in this analysis to identify the most conservative impacts.

The majority of construction workers are expected to come from within Kern County and the neighboring cities of Lancaster and Palmdale. The anticipated primary construction route would be via SR 58, with construction workforce traffic primarily originating from the west and south. The construction workforce was assumed to be equally likely to use SR 58 and SR 14 to travel to the project site. During construction, workers and vendors will park in the onsite project laydown areas (see Figures 2a and 2b of the Project Description, provided to Kern County on February 15, 2011). Transport of oversized loads (i.e., turbines, cranes, and dozers) on state and county roads will require permits from Caltrans and Kern County. The need for and number of pilot cars (a maximum of one to two pilot cars per vehicle that is wider than 12 feet), as well as the timing of the transport, will be at the discretion of Caltrans and Kern County and will be detailed in their respective oversized-load permits.

Approximately 114 daily truck trips will be generated during construction by water trucks, delivery trucks, and turbine delivery trucks (see Table 3). Material delivery trucks and turbine delivery trucks are expected to arrive and depart at regular intervals during the 10-hour workday. Foundation pours would most likely occur during nighttime hours.

Workforce-related traffic is not included in Table 3 as no truck trips will be generated. In addition, as bridge design is still in the preliminary planning phase, traffic associated with construction of the bridge, including material delivery, is included in a separate table (see Table 4).

TABLE 3
Estimated Truck Trips Generated by Material Delivery During Construction for Wind Facility^d

Equipment Delivery ^a	Number of Daily Truck Trips For Construction ^b	Assumptions ^c
Water trucks	50	5 trucks needed, 5 round-trips per day each
Delivery trucks	24	12 trucks needed, 1 round-trip per day each
Turbine delivery	40	10 trucks per turbine, 10 turbines per week at 20 round-trip deliveries per day.
Total daily truck trips	114	

Notes:

^a Assumes multiple trips from offsite to the project site during construction.

^b Assumes 9 to 12 months of construction and 24 days per month of construction activity.

^c Each round-trip is considered as two truck trips.

^d Estimated truck trips summarized does not include material delivery and traffic associated with construction of the bridge across the LADWP aqueduct.

Approximately 21 daily truck trips would be generated during construction of the bridge by water trucks and delivery trucks if this access option is selected (see Table 4). Construction of the bridge is anticipated to take approximately 3 months, and construction of the bridge embankments is expected to take approximately 2 to 3 months. The bridge would need to be constructed prior to construction of the rest of the project site, as it will provide site access to construction vehicles.

TABLE 4
Estimated Truck Trips Generated by Material Delivery During Construction of Bridge over LADWP Aqueduct^a

Equipment Delivery	Number of Daily Truck Trips For Construction ^c	Assumptions ^d
Water trucks	1	1 truck needed, 1 round-trip per day
Concrete Delivery trucks	1	46 trucks from local supplier or 32 trucks and 7 precast girder deliveries.
Delivery trucks	1	10 trucks for precast or steel piles; 6 trucks for bar reinforcing steel; 12 trips of miscellaneous materials
Borrow Material delivery trucks ^b	18	435 truck loads
Total daily truck trips	21	

Notes:

^a The bridge design is currently being discussed with LADWP and Kern County; therefore estimated truck trips are based on a reasonably expected final design.

^b Assumes borrow material is brought from off-site. If material is "borrowed" from onsite, the scrapers would move the material without the need for trucks.

^c Assumes 3 months for construction of bridge, 2 months for construction of embankments, and 24 days per month of construction activity.

^d Each round-trip is considered as two truck trips.

Table 5 is a summary of the expected changes in LOS with the addition of project-related traffic (worker and truck trips). The addition of construction traffic to the existing traffic is not expected to exceed the capacity of area roadways, and all roadway segments studied will continue to operate at an acceptable LOS.

Some existing dirt roads within the project site would be graded, widened, and compacted to provide adequate construction and maintenance access to project facilities. Where required, new access roads would be constructed. All site access roadways would be private and would therefore be gated to restrict public use. Also, all modifications to existing onsite access roads and any new access roads are not expected to result in an increase to public transportation hazards or maintenance costs due to design or incompatible use. However, all new project access roads would require Access Road Design and Encroachment Permits from both Kern County and Caltrans.

Designated parking spaces do not exist along the roadways in the project area; therefore, construction-related traffic and roadway lane closures would not result in a reduction of available public parking supply. Additionally, construction vehicles would park in the onsite project laydown areas located on the 3,200-acre project site, so available public parking would not be reduced.

TABLE 5
Construction Conditions Traffic Operations Summary

Roadway	Segment Between	Added Construction Traffic*	Total Construction Peak Hour Volume	Construction V/C Ratio	Construction LOS	Existing LOS
SR-58 EB	Fairfax Road and SR 184	139	2674	0.50	C	B
SR-58 WB	Fairfax Road and SR 184	15	2990	0.55	C	C
SR-58 EB	SR-184 and Edison Road	139	1907	0.53	C	B
SR-58 WB	SR-184 and Edison Road	15	2090	0.58	C	C
SR-58 EB	SR-202 and Mill Street	139	2007	0.56	C	C
SR-58 WB	SR-202 and Mill Street	15	2207	0.61	C	C
SR-58 EB	Randsburg Cut-Off Road and SR 14	139	1173	0.33	B	A
SR-58 WB	Randsburg Cut-Off Road and SR 14	15	1229	0.34	B	B
SR-14 NB	Silver Queen Road and SR 58	138	1449	0.40	B	B
SR-14 SB	Silver Queen Road and SR 58	15	889	0.25	A	A
SR-14 NB	Rosamond Boulevard and Silver Queen Road	138	1518	0.42	B	B
SR-14 SB	Rosamond Boulevard and Silver Queen Road	15	935	0.26	A	A
SR-14 NB	County Line and Rosamond Boulevard	138	2105	0.58	C	C
SR-14 SB	County Line and Rosamond Boulevard	15	1326	0.37	B	B

Notes:

* Truck trips were converted to passenger car by applying a Passenger Car Equivalent factor of 1.5. It was assumed that 10 trucks were traveling to and from the project site during the peak hour.

Project Operations Traffic

Once constructed, wind operations typically employ a relatively small number of staff. Approximately 15 full-time and part-time employees, including wind turbine technicians, operations personnel, administrative personnel, and managers, would be employed to operate and maintain the project. Employees required for operation of the project are expected to originate from the local area. The operational workforce is expected to generate approximately 15 daily round-trips. In addition, one diesel truck per day would be needed during project operations. One diesel truck and 15 employee vehicle round-trips daily would not result in a substantial number of trips on roadways in the project vicinity. During operation, workers will park at the facility's operations and maintenance building.

Traffic Assessment Summary

Traffic volumes fluctuate throughout the day (with peak periods generally occurring from 7:00 to 9:00 AM and 4:00 to 6:00 PM). Based on the information presented above, project construction is forecasted to generate a worst-case scenario of 114 truck trips and 524 worker trips daily (maximum of 262 workers each driving their own automobile roundtrip) during the AM and PM peak hours. If construction of a bridge across the Los Angeles Aqueduct is selected as the preferred site access option, the bridge would be constructed prior to construction of the rest of the project. The 21 daily truck trips associated with bridge construction is well below the estimated 114 daily truck trips needed for the remainder of project construction. During construction, roadways would continue to operate at an acceptable LOS. However, temporary lane closures could create short-term delays.

During project operations the limited traffic to be generated from up to 15 full-time and part-time operational worker vehicles and one diesel truck is not expected to result in any degradation of LOS on SR 58 or SR 14.

Conclusions

Based on the above analysis, project characteristics, and ideal siting conditions, no significant traffic impacts are expected from either project construction or operations.

Appendix I-1

Water Supply

Appendix I

Water Resources

Altis Field Wind Project Water Supply Assessment

TO: The Project and the Department of the Interior

FROM: The Bureau of Land Management

DATE: March 22, 2011

Appendix I-1

Water Supply Assessment

The Altis Field Wind Project is a proposed 2,200-acre wind energy project located in the Altis Field area, approximately 10 miles north of the town of Altis, in Kern County, California. The project is owned and operated by Altis Wind Energy, LLC. The project consists of 2,200 acres of land, of which approximately 1,000 acres are currently under agricultural use. The project is located within the Altis Field area, which is a designated water supply area for the City of Altis. The project is located within the Altis Field area, which is a designated water supply area for the City of Altis. The project is located within the Altis Field area, which is a designated water supply area for the City of Altis.

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Project Description

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Alta East Wind Project Water Supply Assessment

PREPARED FOR: Alta Windpower Development, LLC

PREPARED BY: CH2M HILL

DATE: March 22, 2011

Purpose

Water Code Sections 10910 through 10915 require land use planning entities, when evaluating certain development projects, to request an assessment of the availability of water supplies from the public water system that will provide water to the proposed project. If there is no public water system, then the assessment must be performed by the Lead Agency under the California Environmental Quality Act (CEQA). The Water Supply Assessment (WSA) must be performed in conjunction with the environmental review process that is associated with the project and required under CEQA. The WSA must identify any existing water supply entitlements, water rights, or water service contracts held within the public water system associated with the proposed project.

If the public water system relies on groundwater supplies, the WSA must describe all groundwater basins from which the proposed project will be supplied. For each basin that has not been adjudicated, the assessment should indicate whether the California Department of Water Resources (DWR) has identified the basin as overdrafted or has projected that the basin will become overdrafted if present management conditions continue.

Project Description

The Alta East Wind Project is proposed to be located on approximately 3,200 acres on the northern and southern sides of State Route 58 in southeastern Kern County, California, within an area of existing wind development commonly referred to as the Tehachapi Wind Resource Area. The project area is approximately 3 miles northwest of the community of Mojave and approximately 11 miles east of the city of Tehachapi. The project is located in San Bernardino Base Meridian and Township 11 North, Range 13 West, Section 3; Township 12 North, Range 13 West, Section 34; Township 12 North, Range 12 West, Section 31; and Sections 26, 27, 28, 32, 33, 34, and 35 of Township 32 South, Range 35 East of the 1973 Mojave, California 7.5' and the 1995 Monolith, California 7.5' U.S. Geologic Survey quadrangle maps. The location of the project site is shown in Figure 1.

The project site (defined as the area within the project boundary shown on Figure 2) lies on both private and federal lands. Federal lands within the project area are under the jurisdiction of the U.S. Bureau of Land Management (BLM); private lands are under the jurisdiction of Kern County. This WSA assesses water demand for the project as a whole on both private and BLM-administered lands.

The proposed development is a wind energy facility with a nameplate capacity rating of approximately 300 megawatts and includes ancillary facilities and supporting infrastructure. Up to 120 wind turbine generators (WTGs) would be installed. Approximately 35 percent of the project's area (1,116 acres) and approximately 26 to 30 percent of the WTGs would be located on land managed by Kern County; the remaining portion would be located on land managed by the BLM. The project facilities would include service roads, a power collection system, communication cables, overhead and underground transmission lines, electrical switchyards, a project substation, meteorological towers, telecommunication facilities, and an operations and maintenance (O&M) facility (Figure 2). Temporary facilities would include construction access roads, laydown areas, and a concrete batch plant.

The project site is located in the southwestern portion of the South Lahontan hydrologic region. Portions of the project do not overlay an apparent groundwater basin; however, most of the project is within or surrounded by the Fremont Valley groundwater basin (Figure 3).

Most of the water required for the project would be needed for construction over a relatively short period (9 to 12 months of construction). Construction activities that consume water include dust suppression and concrete mixing. The source of water during construction has not yet been finalized but will likely include water obtained from local water purveyors in the Mojave area (e.g., Mojave Public Utility District [MPUD]) or in the Tehachapi area (e.g., the Tehachapi-Cummings County Water District [TCCWD]).¹ Water for construction could be obtained from either or both of these purveyors. The source of construction water will be determined and facilitated by the engineering, procurement, and construction (EPC) contractor selected to build the facility. The EPC contractor will be required to coordinate with these water purveyors and will ensure that procurement of water for project construction purposes is in compliance with all federal, state, and local laws and ordinances.

A small portion of the overall project water demand will be realized over the life of the project and is associated with routine O&M activities. An onsite water well is expected to be the source of water for these activities. It is expected that the O&M well will be installed in the vicinity of the project's O&M facility to satisfy the expected 200-gallon-per-day demand (about 0.224 acre-feet [AF] per year), if hydrogeologic conditions allow. The O&M well would be located in an area with favorable hydrogeologic properties. Installation and operation of the well will be completed by a separate contractor, and execution of that work will be in compliance with all federal, state, and local laws and ordinances.

Documentation of Supply

The following sections discuss available supplies from MPUD or TCCWD, the two potential sources of construction water, including descriptions of the groundwater basins that provide most of their supplies. Operational water supplies will be taken from an onsite well, which will draw groundwater from the Fremont Valley groundwater basin.

¹ Retail water purveyors under TCCWD include the City of Tehachapi, Golden Hills Community Services District (CSD), Bear Valley CSD, and Stallion Springs CSD.

Mojave Public Utility District

The community of Mojave is located in the South Lahontan hydrologic region, which includes three major surface water systems (Mono Lake, Owens River, and Mojave River watersheds) and numerous separate closed groundwater basins. The Fremont Valley groundwater basin is located in eastern Kern County and northwestern San Bernardino County (DWR, 2004). The basin is bounded to the northwest by the Garlock fault zone and to the east by crystalline rock formations. The Antelope Valley basin bounds the Fremont Valley basin to the southwest along a groundwater divide. Quaternary alluvium and lacustrine deposits are the most important water-bearing materials in the basin. Alluvium ranges in thickness between 1,190 feet along the margin of the basin and thins toward the middle of the basin near Koehn Lake. Groundwater in the alluvium is generally unconfined. The total storage capacity of the basin is calculated to be 4,800,000 AF (DWR, 2004). Average annual well pumping was approximately 32,000 AF during the 1950s through the early 1960s (DWR, 2004). DWR has not identified the Fremont Valley groundwater basin as being in or projected to be in an overdraft condition (DWR, 2004).

Water service to the Mojave community is provided by MPUD. Groundwater pumped from the Fremont Valley groundwater basin accounts for the majority of the water provided by MPUD, with supplemental supplies available from the State Water Project (SWP) (MPUD, 2004; MPUD, 2011). MPUD supplies groundwater to its service area by extracting from seven operating wells. Water production from the wells averages between 450 and 550 million gallons per year (1,380 and 1,687 AF per year). MPUD demand is highest in the summer and lowest in the winter. The instantaneous yield from the existing wells is approximately 800 to 900 million gallons per year (2,453 to 2,760 AF per year) (Kern County, 2003). MPUD acknowledges that its supplemental SWP supply is an interruptible source, although it contributes to total available supplies in high-use months (MPUD, 2004).

MPUD prepared an Urban Water Management Plan in 2004, although it is not required to because of the utility's small size. According to MPUD, estimated available supplies will be able to meet the community of Mojave's development demands (see Tables 1 and 2 and MPUD, 2004). Water demands are based on reasonable growth and on the assumption that growth will occur considering land uses for residential, commercial, industrial, public facilities, and other service areas. The reliability comparison for single year and multiple dry year supply scenarios is consistently 1,983 AF per year because of available groundwater pumping capacity in all year types (MPUD, 2004).

TABLE 1

Current and Projected Water Available from the Mojave Public Utility District (AF)
Alta East Wind Project

	2010	2015	2020	2025	2030
Groundwater Production	3,870	6,290*	8,710*	8,710	11,130*
Demand	3,708	5,019	6,318	7,629	8,940
Available Surplus	162	1,271	2,392	1,081	2,190

*Increase in groundwater production is because of construction of a 1,500-gallon-per-minute well.
Source: MPUD, 2004 (data extrapolated for 2030)

TABLE 2

Single and Multiple Dry Year Water Available from the Mojave Public Utility District (AF)
Alta East Wind Project

	Current Supply	Single Dry Year Scenario	Multiple Dry Year Scenario		
			Year 1	Year 2	Year 3
Groundwater Production*	1,983	1,983	1,983	1,983	1,983
Demand*	1,620	1,620	1,620	1,620	1,620
Available Surplus	363	363	363	363	363

*Based on production and demand in 2004.

Source: MPUD, 2004

Tehachapi-Cummings County Water District

TCCWD manages three adjudicated groundwater basins; from west to east, these are the Cummings Basin, Brite Basin, and Tehachapi Basin. The basins are all bounded by the Tehachapi Mountains to the south and the Sierra Nevada to the north. The primary water-bearing units are Pleistocene to recent alluvial fans around the margins of the basins and floodplain deposits in the centers of the basins. Groundwater users in the Cummings, Brite, and Tehachapi basins include agricultural, municipal, and industrial. In 1973, the Cummings, Brite, and Tehachapi basins were adjudicated and allowed pumping allocations of 4,090, 500, and 5,524 AF per year, respectively. The pumping allocations did not vary among normal, single dry, and multiple dry years (Kern County, 2008; Kern County, 2010). Since adjudication, recharge and recovery projects have been constructed and average groundwater elevations have recovered approximately 70 feet (TCCWD, 2003).

TCCWD also manages imported SWP water supplies, which it receives through contracts with the Kern County Water Agency. Contract amounts are up to 15,000 AF per year of municipal supplies and up to 4,300 AF per year of agricultural supplies, with an additional 700 AF per year of surplus water for agricultural use.

Total water available during normal, single dry, and multiple dry water year scenarios is presented in the Greater Tehachapi Area (GTA) Specific Plan, Appendix I Updated Water Supply Assessment (Kern County, 2010). The City of Tehachapi and other TCCWD water purveyors are discussed (including 20-year projections) that take zero allocations from the SWP into consideration. The information is based on the assumption that the purveyors will reach their yearly storage goals. Current and projected water supplies through 2030 include Tehachapi Basin allowed pumping allocations, leased allowed pumping, and the SWP; this indicates that adequate water is available to meet projected demand. Given the projections in the GTA Specific Plan, available water exceeds demand during normal, single dry, and multiple dry year scenarios in consideration of existing and planned future uses, including agricultural and manufacturing uses (see Tables 3 and 4 and Kern County, 2010).

TABLE 3

Current and Projected Water Available from the Tehachapi-Cummings County Water District (AF)
Alta East Wind Project

	2010	2015	2020	2025	2030
Supply*	20,017	22,828	22,735	22,641	22,566
Demand	15,129	15,611	16,165	16,809	17,341
Available Surplus	4,888	7,217	6,570	5,832	5,225

*Supply includes Tehachapi Basin allowed pumping allocations, leased allowed pumping, and the SWP.
 Source: Kern County, 2010

TABLE 4

Single and Multiple Dry Year Water Available from the Tehachapi-Cummings County Water District (AF)
Alta East Wind Project

	2015 Normal	2015 Single Dry Year Scenario	Multiple Dry Year Scenario		
			2013	2014	2015
Supply*	22,828	17,009	19,308	20,273	20,080
Demand	15,611	15,611	15,418	15,514	15,611
Available Surplus	7,217	1,398	3,890	4,759	4,469

*Supply includes Tehachapi Basin allowed pumping allocations, leased allowed pumping, and the SWP.
 Source: Kern County, 2010

Demand Analysis

This section summarizes anticipated project water demands for construction and operations as well as anticipated water sources. Total project water demands through 2030 are shown in Figure 4. Project water demand would be highest during the construction phase for activities such as dust suppression and concrete mixing. Water needed for project-related construction activities would be obtained by the EPC contractor and could be trucked in from either or both nearby communities of Mojave and Tehachapi. Approximately 170,000 gallons per day (based on 24 working days per month) would be needed during the 9- to 12-month construction period. Total water use during construction is anticipated to be between 113 and 150 AF. For construction purposes, a one-time purchase agreement for the duration of construction to supply up to approximately 150 AF would be secured from these water purveyors. The total demand of 150 AF could be partially provided by both purveyors at a ratio that has not yet been determined. Per capita, water use in Kern County averages 309 gallons per day (Aquanomics, 2008), with an average household size in Kern County of three people (U.S. Census Bureau, 2000). One single family dwelling's (SFD) average daily water use is 927 gallons, or approximately 1.04 AF per year. Project water use during construction is anticipated to be approximately 183 SFD equivalents. This use would occur on a one-time basis and would not be ongoing.

Operations water would be provided by an onsite well extracting groundwater from the Fremont Valley groundwater basin. It is anticipated that the well would be located close to the O&M facility. Based on the size of the O&M facility, it is anticipated that water demand

would be approximately 200 gallons per day/365 days per year (0.224 AF per year). This is equivalent to less than one SFD.

Sufficiency Determination

Sufficient water is available for construction of the Alta East Wind Project, especially given the surplus water available from both MPUD and TCCWD. As shown in Tables 1 through 4, more than 150 AF of surplus water is available in normal, single dry, and multiple dry years.

Sufficient water is also available for project operations. Project operations will require a modest yield, and extractions from the onsite well are not expected to affect the Fremont Valley groundwater basin. As previously stated, groundwater extraction associated with an onsite well for O&M activities would be minimal (0.22 AFY) and is considered negligible within the overall context of the groundwater in storage and ongoing annual extractions from this non-adjudicated basin.

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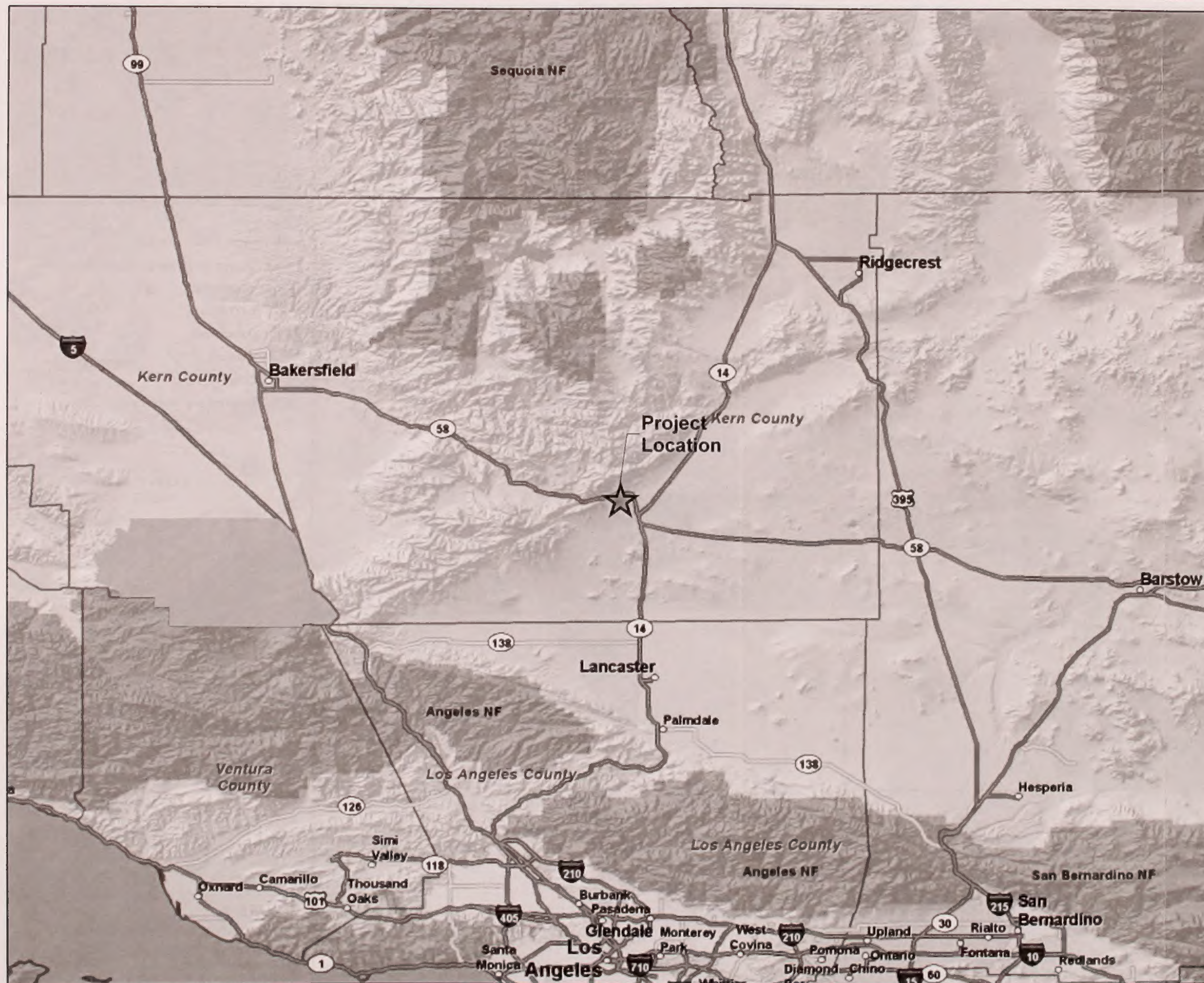
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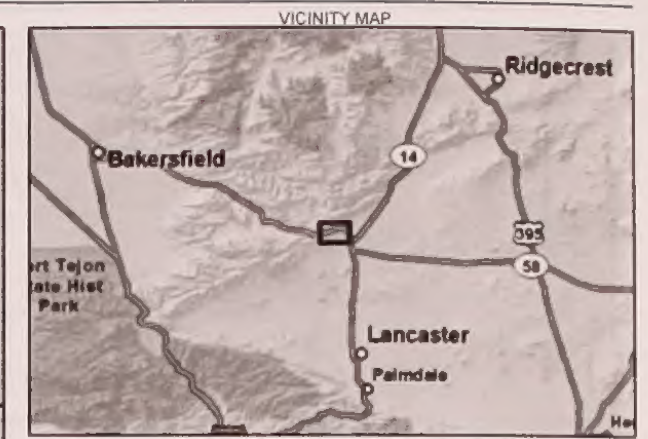
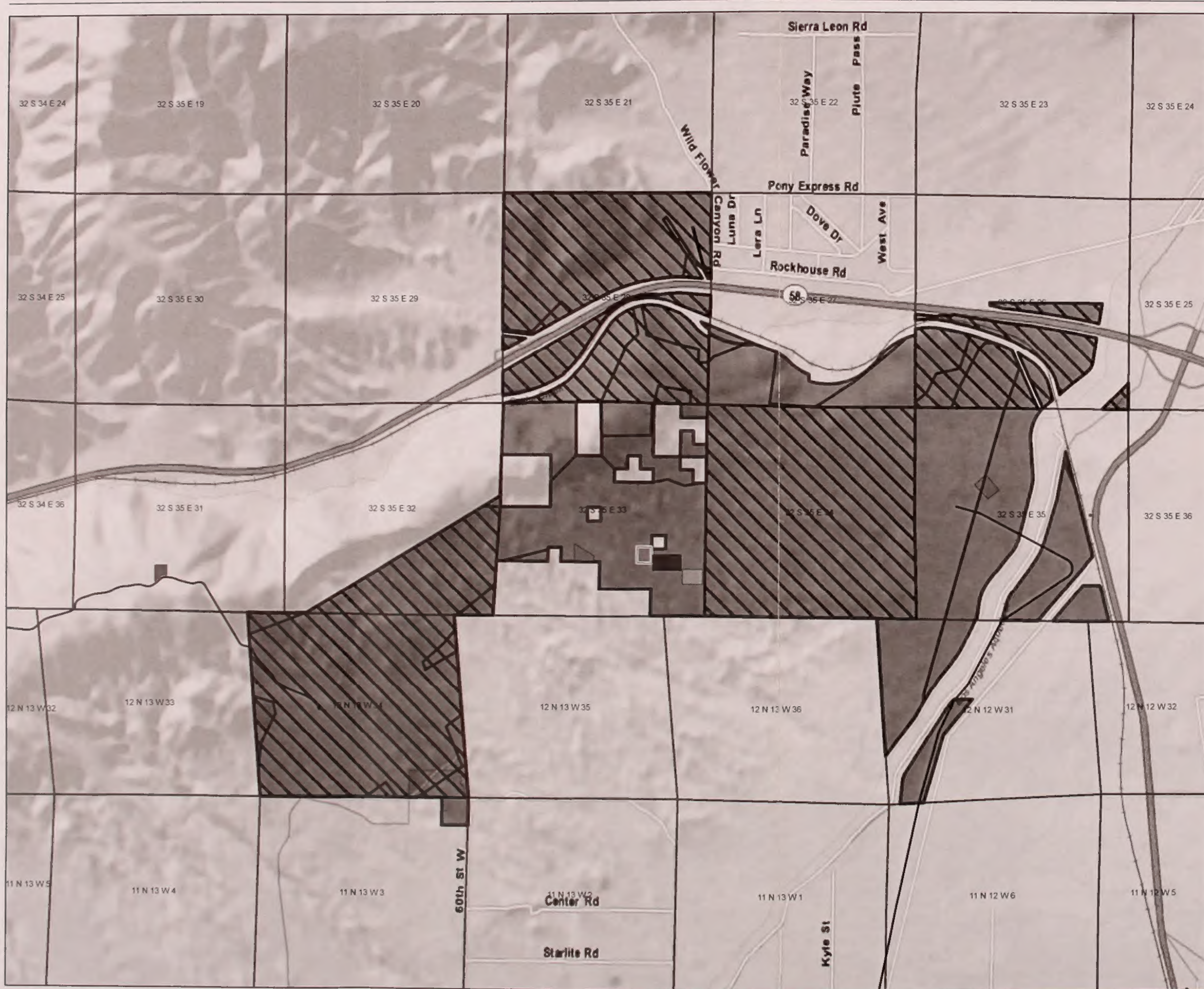


LEGEND

- ★ Alta East Project Area

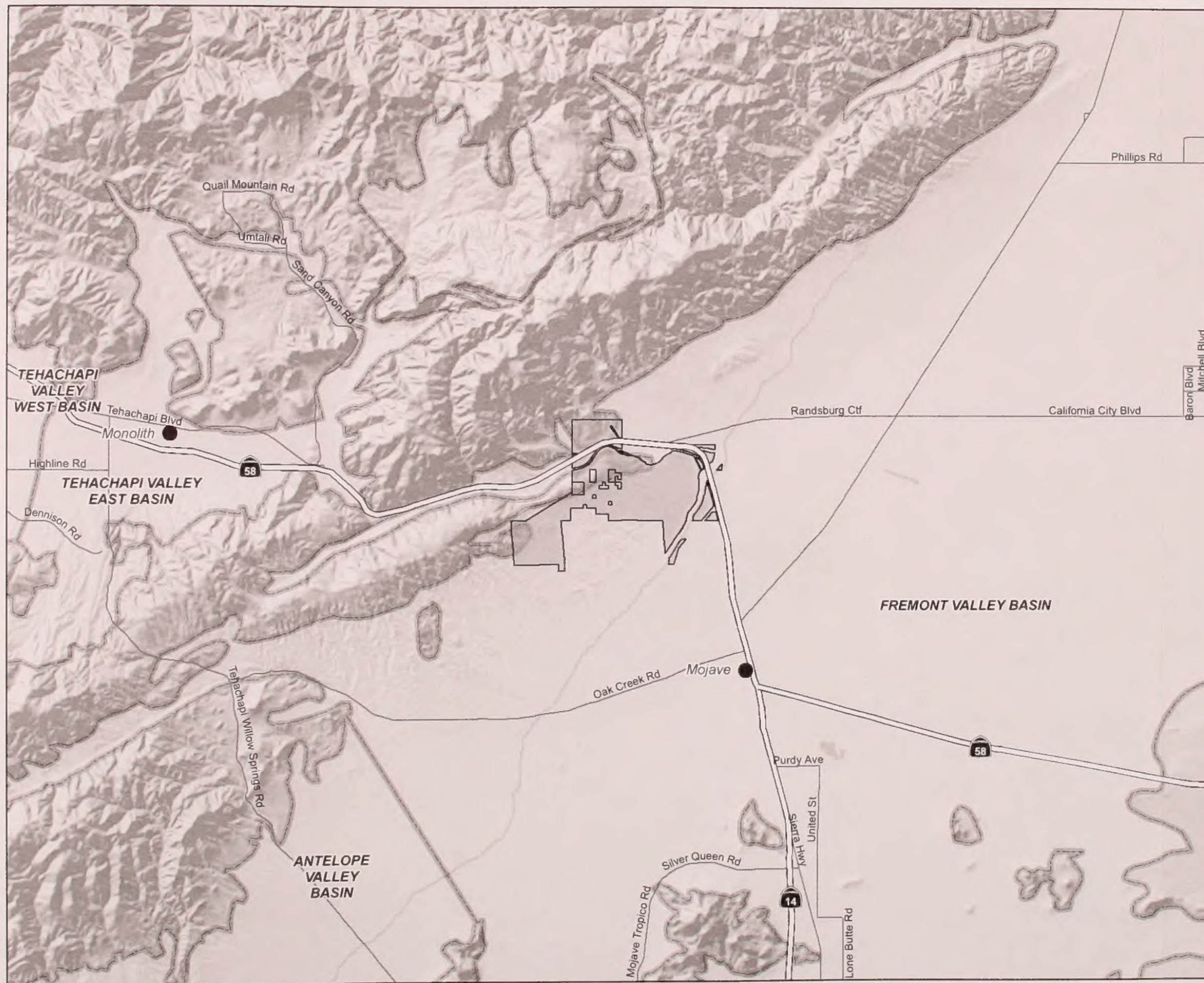


FIGURE 1
Regional Vicinity Map
Alta East Wind Project
Alta Wind Energy Center Project



- LEGEND**
- Proposed Access Road
 - Proposed Wind Energy Development Area
 - ▨ Federal Lands
 - Project Area
 - Laydown Area
 - Substation
 - Batchplant
 - Operations and Maintenance Facility

FIGURE 2
Project Area and Wind Energy Development Area
 Alta East Wind Project
 Alta Wind Energy Center Project



LEGEND

- City
- Highway
- Major Road
- Groundwater Basin Boundary
- Project Area

Note:
1. Groundwater Basin Data Source: California Department of Water Resources, 2003.



FIGURE 3
Project Area Groundwater
Basin Boundaries

Alta East Wind Project
Alta Wind Energy Center Project

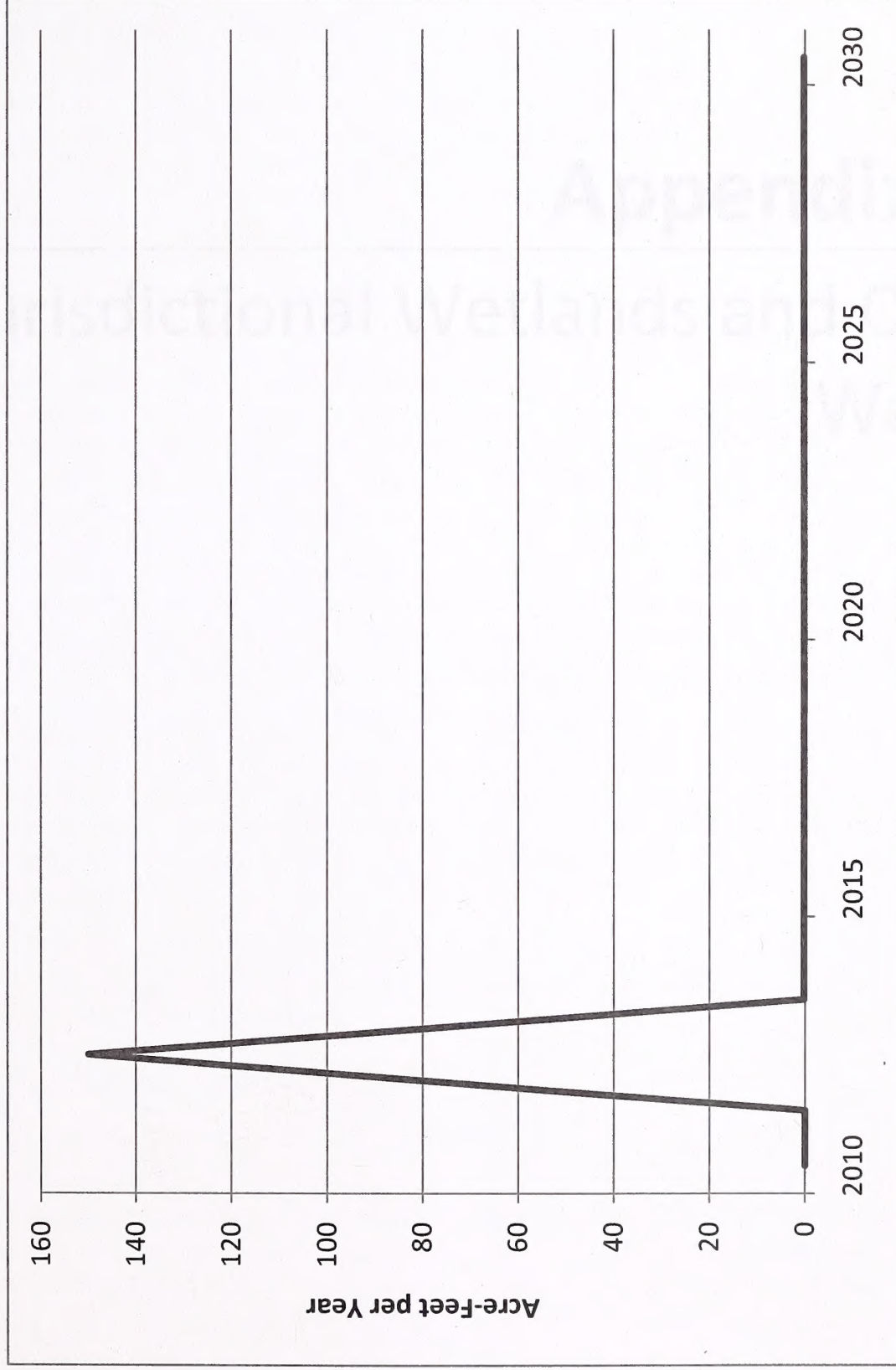


FIGURE 4
Total Project Water Demands through 2030
Alta East Wind Project
Alta Wind Energy Center Project

Appendix I-2

Jurisdictional Wetlands and Other Waters

1.0 Overview of Applicable Regulations

1.1 Federal Regulations

1.1.1 Clean Water Act

The CWA seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Wherever the discharge of pollutants into navigable waters is concerned, the CWA sets a goal of no net loss of water quality. The CWA is a comprehensive law that regulates the discharge of pollutants into navigable waters, and it also sets standards for the quality of the water. The CWA is enforced by the EPA and the Army Corps of Engineers.

- Section 401 – Federal Water Quality Certification (FWQC) – requires that any discharge of pollutants from a point source into navigable waters must comply with the CWA's water quality standards.

Jurisdictional Wetlands and Other Waters – Alta East Wind Energy Project

PREPARED FOR: Randy Jenks, Alta Windpower Development, LLC

PREPARED BY: Kathy Rose, CH2M HILL
Laurel Karren, CH2M HILL

COPIES: Aarty Joshi, CH2M HILL

DATE: July 11, 2011

This memorandum describes jurisdictional wetlands and other waters that are present at Alta East Wind Energy Project site and a proposed offsite transmission line connecting the project site to adjacent existing Alta Windpower Development, LLC (AWD) projects. This evaluation is based on a desk-top review, field delineation of jurisdictional features, and experience with other projects in the vicinity.

The project location is shown on Figures 1 and 2. The U. S. Geological Survey National Hydrography Dataset (NHD) blue-line streams are classified as intermittent; these are shown on Figure 2. Additionally, the National Wetland Institute (NWI) has mapped riverine wetlands on Cache Creek, near the project site (Figures 2 and 3).

The project is located in the southwestern portion of the South Lahontan Hydrologic Region (HR). Within the South Lahontan HR, the project straddles the Antelope Hydrologic Unit (HU) and the Fremont HU (see Figure 3). Runoff from the majority of the site flows southeasterly toward Rogers Dry Lake and Rosamond Dry Lake (Figure 3), and infiltrates in soils of the bajada. In some areas, the Los Angeles aqueduct may provide a hydrologic barrier to offsite runoff.

Federal and state laws and regulations that are applicable to wetlands and other waters, methodology used to delineate jurisdictional features, and preliminary review of results are provided in the following sections.

1.0 Overview of Applicable Regulations

1.1 Federal Regulations

Federal Clean Water Act

The CWA seeks to restore and maintain the chemical, physical, and biological integrity of the nation's water. The CWA sets up a system of water quality standards, discharge limitations, and authorization requirements. Authorizations associated with Sections 401 and 404 of the CWA (described below) may be required where waters of the U.S. would be affected by projects.

- Section 401 – Section 401 of the CWA (governed by 33 United States Code [USC] 1341) and 40 Code of Federal Regulations (CFR) 121 requires a Water Quality Certification

from the State Water Resources Control Board (State Board) or Regional Water Quality Control Board (RWQCB) when a project (1) requires a federal license or permit (such as a Section 404 permit), and (2) will result in a discharge to waters of the U.S. The certification may be conditioned. Project activities that typically result in a discharge subject to Section 401 Water Quality Certification are the construction and subsequent operation of a facility.

- Section 404 – Activities that have the potential to discharge fill materials into waters of the U.S., including adjacent wetlands, are regulated under Section 404 of the CWA, governed by 33 USC 1344 and 33 CFR 323, and administered by USACE. Fill activities may be permitted by a Nationwide or Individual Permit. The Nationwide Permit (NWP) Program involves certain activities that have been pre-authorized by USACE because USACE has determined that such activities would have minimal individual and cumulative adverse effects on the aquatic environment. The Individual Permit (IP) program applies to projects that do not meet the significance thresholds or general permit conditions of the NWP program. Under Section 404 (b)(1) guidelines, permittees are allowed to discharge dredged or fill material into the aquatic system only if there is no practicable alternative that will have fewer adverse impacts.

On January 15, 2003, the U.S. Environmental Protection Agency (EPA) and USACE issued joint guidance for determining jurisdiction. USACE and EPA concluded that jurisdiction should not be asserted over isolated waters that are both intrastate and non-navigable, where the only basis for the assertion is the Migratory Bird Rule. Where a wetland is found to be “adjacent” to a navigable water or tributary to navigable water, USACE field staff should assert jurisdiction (USACE and EPA, 2003).

On June 5, 2007, USACE and EPA issued additional guidance. In summary, jurisdiction will be asserted over (1) traditional navigable waters, (2) wetlands adjacent to traditional navigable waters, (3) non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (typically 3 months), and (4) wetlands that directly abut such tributaries.

USACE issued Regulatory Guidance Letter No. 08-02 on June 26, 2008, which provided clarification on conducting jurisdictional determinations (USACE, 2008). Specific requirements resulting from this guidance include the following: (1) use of the Approved Jurisdictional Determination Form to provide information to the USACE to make a “significant nexus” ruling; and (2) use of the Preliminary Jurisdictional Process and Approved Jurisdictional Process to expedite applications where there is clear evidence of jurisdictional waters and/or wetlands (Preliminary Jurisdictional Process), or where there is not clear evidence and the project must go through the “significant nexus” test (Approved Jurisdictional Process).

Previous Jurisdictional Determinations

Determinations have been issued recently by the USACE for nearby water features. An approved jurisdictional determination was received from the USACE Los Angeles District office (File No. SPL-2010-01014-BAH) concluding that waters within the Alta-Oak Creek Mojave and Alta Infill (Alta Wind I-VI and Alta Wind VIII) projects located in the Oak Creek watershed (including portions of Oak Creek) were not under USACE jurisdiction

because they are isolated, with no significant nexus to a traditional navigable water. Any intermittent and ephemeral drainages or other water features on the project site would also be considered isolated, with no significant nexus to a traditional navigable water, and not regulated under the CWA.

1.2 State Regulations

As indicated above, the State of California has authority for issuance of CWA Section 401 Water Quality Certifications for projects that require a CWA Section 404 permit from the USACE. Furthermore, the State regulates discharges of waste to non-federal waters of the State, pursuant to the Porter-Cologne Water Quality Control Act (Porter-Cologne).

Porter-Cologne

Water Code section 13260 requires “any person discharging waste, or proposing to discharge waste, within any region that could affect waters of the State to file a report of waste discharge (an application for waste discharge requirements)” (Water Code §13260(a)(1)). The term “waters of the State” is defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code §13050(e)).

Under Porter-Cologne, dischargers must notify the regional water board when a project will result in the discharge of dredged or fill material to waters of the State, and the RWQCB is required to issue or waive waste discharge requirements (WDRs) whenever it receives a report of discharge:

The regional board, after any necessary hearing, shall prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge... with relation to the conditions existing in the disposal area or receiving waters upon, or into which the discharge is made or proposed. The requirements shall implement any relevant water quality control plans that have been adopted, and shall take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose ... (Water Code § 13263(a)).

Any excavation or fill placement within these features would require authorization under WDRs to be issued by the Lahonton RWQCB. For construction projects having small dredge/fill impacts to non-federal waters of the State, and that are not required to obtain a National Pollutant Discharge Elimination System (NPDES) permit (i.e., the General Construction Permit adopted by the State Board), coverage under general WDRs may be obtained from the Lahontan RWQCB (R6T-2003-0004). Discharges of fill into waters of the State have been authorized under these WDRs for other wind energy projects in the project vicinity.

Section 1602 of the California Fish and Game Code

This code regulates the alteration of the bed, bank, or channel of a stream, river, or lake, including ephemeral washes. The limit of jurisdiction is subject to the judgment of the California Department of Fish and Game (CDFG) and can include up to the 100-year floodplain level. The Fish and Game Code states that “an entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel or bank of any river, stream or lake...unless certain conditions are met.” Activities

that have the potential to affect jurisdictional areas (i.e., drainages on the project site, including intermittent/ephemeral streams) will require a Streambed Alteration Agreement (SAA) from CDFG. The SAA will specify conditions and mitigation measures that will minimize impacts on water and riparian resources from proposed actions.

3.0 Field Methods

During surveys conducted from April 25–30, 2011, CH2M HILL delineated waters of the State potentially subject to CDFG and RWQCB jurisdiction that could be affected by construction and operation of the project. Field delineations were conducted by field biologists and wetland scientists having substantial experience performing jurisdictional delineations in arid environments. Field methodology and preliminary results are provided below. Representative photographs of stream crossing are attached.

Prior to conducting field surveys, aerial photographs, high-resolution topographic maps, and maps of NHD blue-line streams and NWI wetlands were used to determine potential locations of waters of the State. Surveys for linear facilities (i.e., turbine strings, collection lines, access roads) were conducted within a 400-foot buffer area surrounding the alignment (200 feet either side of the centerline); and surveys of proposed buildings and temporary construction areas were conducted within a 500-foot buffer area surrounding the footprint of the feature. Spatial data for project boundaries, survey areas, and potential drainage features were uploaded onto global positioning system (GPS) equipment having sub-meter accuracy to assist with site navigation and mapping. In the field, transects were walked along linear features and 200 feet on either side of the centerline of these features. For project structures and temporary construction areas, transects were walked perpendicular to the direction of stream flow. Spacing of transects was sufficient to document the presence of any stream or wetland features that might be present. Surveys of a proposed offsite transmission line were also conducted within a 400-foot buffer area surrounding the alignment (200 feet on either side of the centerline).

The RWQCB/CDFG jurisdictional boundaries were identified by measuring the stream widths at the tops of banks (TOB), maximum flood-prone area (if banks were not present), or the edges of the driplines of riparian vegetation, if present. Channel depths were visually estimated at the thalweg (defined as the deepest part of the cross-sectional channel). Changes in vegetation, streambed, and soil characteristics were noted.

Most of the streams surveyed were typical of arid ephemeral streams—they were relatively narrow with a single channel and well-defined banks that would contain higher volume flow. Some streams surveyed were alluvial washes or fans. These systems often contained braided and/or multiple channels with islands that are most likely within the active floodplain or flood-prone area. In these systems, the TOB width captures those island/terraces that are part of the active floodplain contained within the braided channels. The active floodplain within these systems contained typical alluvial fan scrub vegetation that was also used to help identify the extent of the active floodplain or flood-prone area.

A 25-foot steel tape measure was used to measure shorter widths and estimate depth. An Impulse 200LR laser range finder was used to measure distances of more than 25 feet and to measure the 200-foot distance to upstream and downstream points.

The stream data was collected at each crossing and recorded using the GPS. Wetlands were assumed to be present if hydrophytic vegetation and wetland hydrology were observed. Photographs were taken at each stream crossing point.

Following field surveys, polygons were created in geographic information system (GIS) for all state jurisdictional stream features, utilizing stream width measurements in conjunction with aerial imagery. Intersections of project features (such as access roads and collector lines) and jurisdictional waters were identified in GIS, and mapped as stream crossings.

4.0 Results

Based on the desktop review, the surveys, and other field evaluations, none of the water features observed on the Project site would be subject to regulation under the federal Clean Water Act.

State jurisdictional ephemeral streams and desert washes were delineated within the survey area. No probable wetlands were delineated as hydrophytic vegetation and no wetland hydrology were observed. In addition, no riparian vegetation was present along stream corridors. The total area of potential waters of the State delineated on site is approximately 42 acres. The portion of Cache Creek on site is approximately 14 acres.

Based on the current preliminary design, proposed project features, such as access roads and collector lines, will intersect ephemeral streams in approximately 99 locations, and will result in approximately 5 acres of dredge/fill impacts (see Figure 4). As shown in Figure 4, crossings are labeled in accordance with the type of project feature present. Access roads are labeled in the 100s, collector lines in the 200s, and in locations where access lines and collector lines occur together they are labeled in the 300s.

As stated above, no riparian or wetland vegetation was observed within the survey areas. Vegetation observed consisted primarily of upland species, as listed in Table 1.

TABLE 1
Plants Observed in the Project Boundary

Common Name	Scientific Name
Indian ricegrass	<i>Achnatherum hymenoides</i>
Desert needlegrass	<i>Achnatherum speciosum</i>
White bursage	<i>Ambrosia dumosa</i>
Fiddleneck	<i>Amsinckia tessellata</i>
Common saltbush	<i>Atriplex polycarpa</i>
Bractscale	<i>Atriplex serenana</i>
Red brome	<i>Bromus madritensis</i> ssp. <i>rubens</i>
Cheat grass	<i>Bromus tectorum</i>
Mojave suncup	<i>Camissonia brevipes</i>
Brittlebush	<i>Encelia farinosa</i>
California ephedra	<i>Ephedra californica</i>

TABLE 1
Plants Observed in the Project Boundary

Common Name	Scientific Name
Interior goldenbush	<i>Ericameria linearifolia</i>
Rubber rabbitbrush	<i>Ericameria nauseosa</i>
California buckwheat	<i>Eriogonum fasciculatum</i>
Redstem filaree	<i>Erodium cicutarium</i>
Rattlesnake weed	<i>Euphorbia albomarginata</i>
Hopsage	<i>Grayia spinosa</i>
Cheesebush	<i>Hymenoclea salsola</i>
California juniper	<i>Juniperus californica</i>
Utah juniper	<i>Juniperus osteosperma</i>
Creosote bush	<i>Larrea tridentata</i>
Desert alyssum	<i>Lepidium fremontii</i>
Scalebroom	<i>Lepidospartum squamatum</i>
Mojave aster	<i>Machaeranthera tortifolia</i>
Beavertail cactus	<i>Opuntia basilaris</i>
Silver cholla	<i>Opuntia echinocarpa</i>
Phacelia	<i>Phacelia</i> sp.
Desert bitterbrush	<i>Purshia tridentata</i> var. <i>glandulosa</i>
Desert bitterbrush	<i>Purshia tridentata</i> var. <i>glandulosa</i>
Chia	<i>Salvia columbariae</i>
Purple sage	<i>Salvia dorrii</i>
Prince's plume	<i>Stanleya pinnata</i>
Tamarisk	<i>Tamarix</i> spp.
Joshua tree	<i>Yucca brevifolia</i>
Mojave yucca	<i>Yucca schidigera</i>

5.0 References

U.S. Army Corps of Engineers (USACE). 2008. Regulatory Guidance Letter 08-02: Jurisdictional Determinations. 26 June.

U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA). 2003. Federal Register Vol. 68, No. 10. Appendix A: Joint Memorandum.

U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA). 2007. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*. June 5.

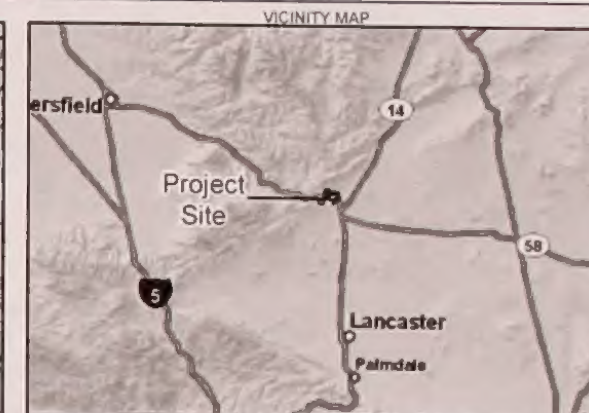
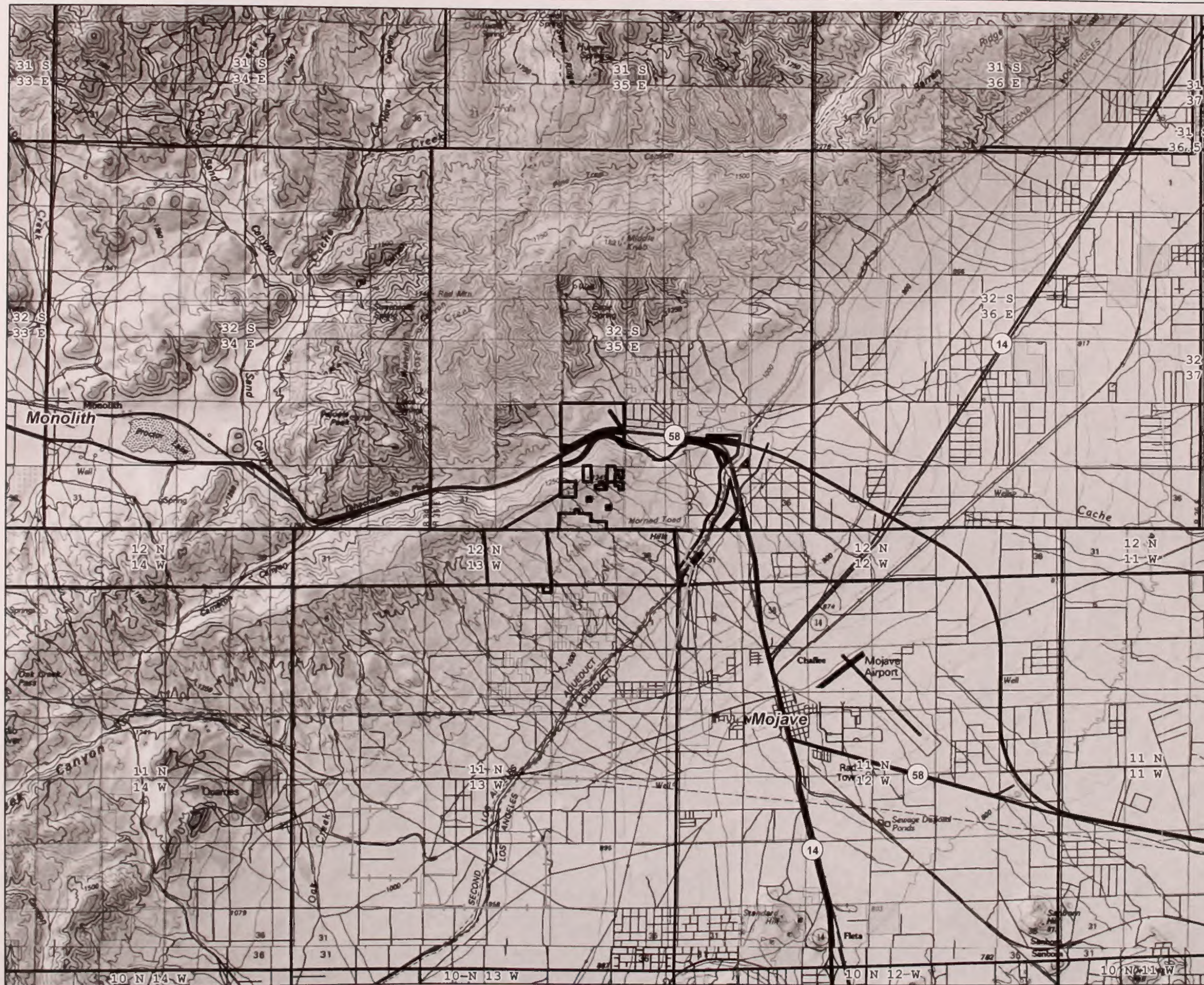
U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA) 1987
 Clean Water Act Amendments Following the US Supreme Court Decision in *City of Los Angeles v. City of Long Beach* (1987)

State	Year	Population	Water Use (MGD)	Wastewater Treatment (MGD)	Wastewater Discharge (MGD)
Alabama	1980	2,000,000	1,000	500	500
Alabama	1985	2,000,000	1,000	500	500
Alabama	1990	2,000,000	1,000	500	500
Alabama	1995	2,000,000	1,000	500	500
Alabama	2000	2,000,000	1,000	500	500
Alabama	2005	2,000,000	1,000	500	500
Alabama	2010	2,000,000	1,000	500	500
Alabama	2015	2,000,000	1,000	500	500
Alabama	2020	2,000,000	1,000	500	500
Alabama	2025	2,000,000	1,000	500	500
Alabama	2030	2,000,000	1,000	500	500
Alabama	2035	2,000,000	1,000	500	500
Alabama	2040	2,000,000	1,000	500	500
Alabama	2045	2,000,000	1,000	500	500
Alabama	2050	2,000,000	1,000	500	500
Alabama	2055	2,000,000	1,000	500	500
Alabama	2060	2,000,000	1,000	500	500
Alabama	2065	2,000,000	1,000	500	500
Alabama	2070	2,000,000	1,000	500	500
Alabama	2075	2,000,000	1,000	500	500
Alabama	2080	2,000,000	1,000	500	500
Alabama	2085	2,000,000	1,000	500	500
Alabama	2090	2,000,000	1,000	500	500
Alabama	2095	2,000,000	1,000	500	500
Alabama	2100	2,000,000	1,000	500	500

Figures

References

- U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA) 1987
 Clean Water Act Amendments Following the US Supreme Court Decision in *City of Los Angeles v. City of Long Beach* (1987)
- U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA) 1987
 Clean Water Act Amendments Following the US Supreme Court Decision in *City of Los Angeles v. City of Long Beach* (1987)



- LEGEND**
- Project Boundary
 - Transmission Line
 - Townships
 - Highway
- AGENCY**
- BLM
 - Private
 - State

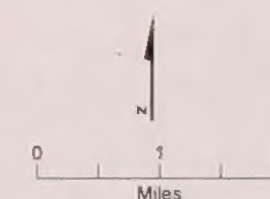
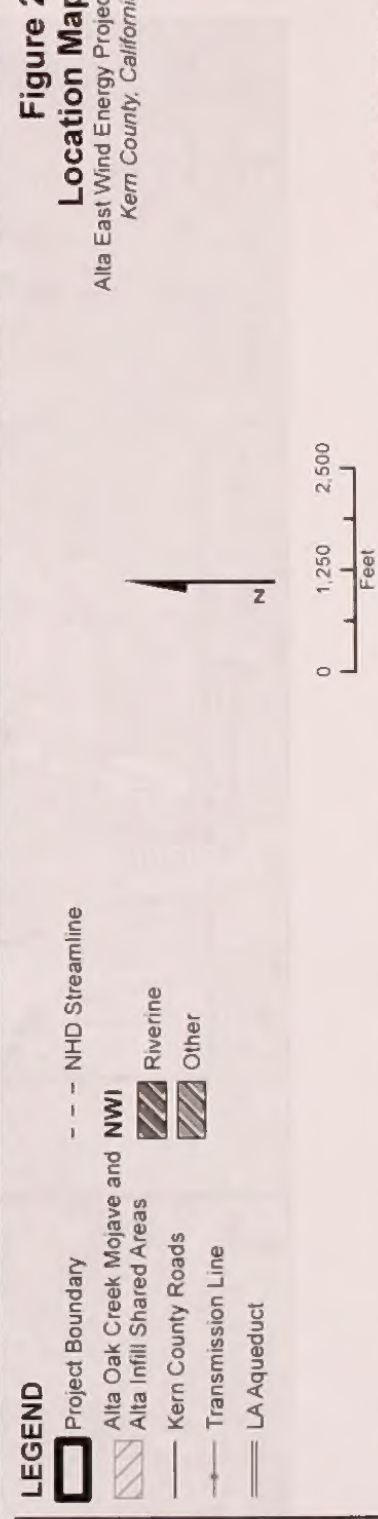
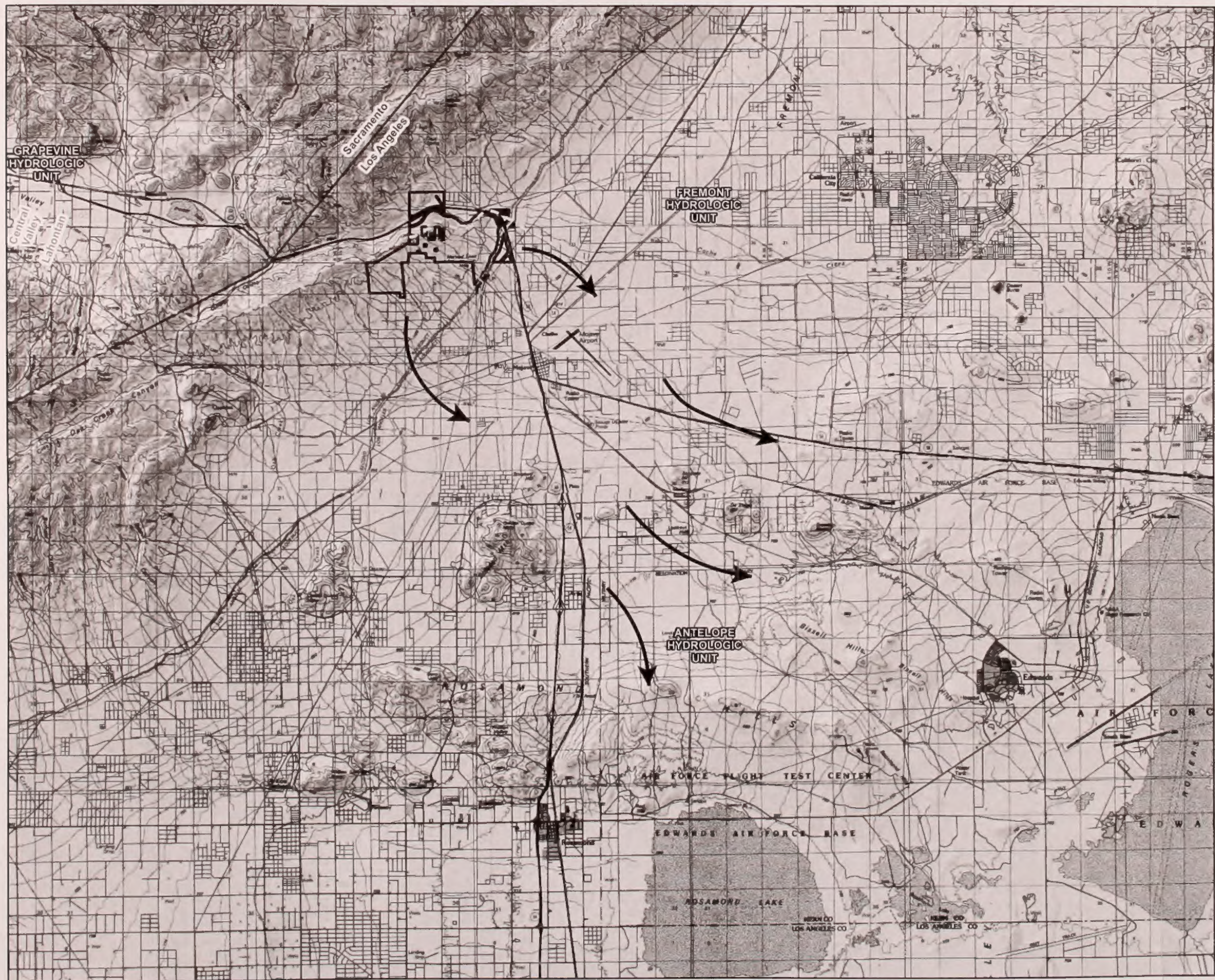


FIGURE 1
Regional Vicinity Map
 Alta East Wind Energy Project
 Kern County, California



A vertical scale bar labeled "Feet" with markings at 0, 1,250, and 2,500.



- LEGEND**
- Transmission Line
 - ▭ Project Boundary
 - ▭ RWQCB
 - ▭ USACE Boundary
 - ▭ Hydrologic Unit
 - ➔ Surface Water Flow

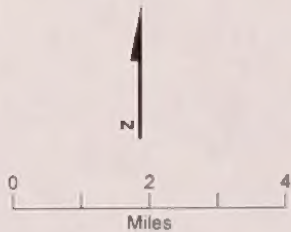
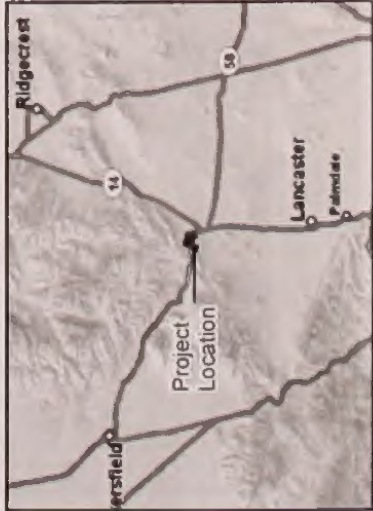


FIGURE 3
Hydrology Map
 Alta East Wind Energy Project
 Kern County, California



LEGEND

- | | |
|---------------------|--|
| ● Stream Crossing | □ Laydown |
| ● Turbine | □ Batch Plant |
| — Collectors | ▨ Alta Oak Creek Mojave and Alta Infill Shared Areas |
| — Access Road | □ Survey Area |
| — Transmission Line | - - - NHD Streamline |
| □ Project Boundary | ▨ NWI Wetland |
| □ Substation | ■ Stream Delineation |
| □ O&M Building | |

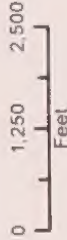
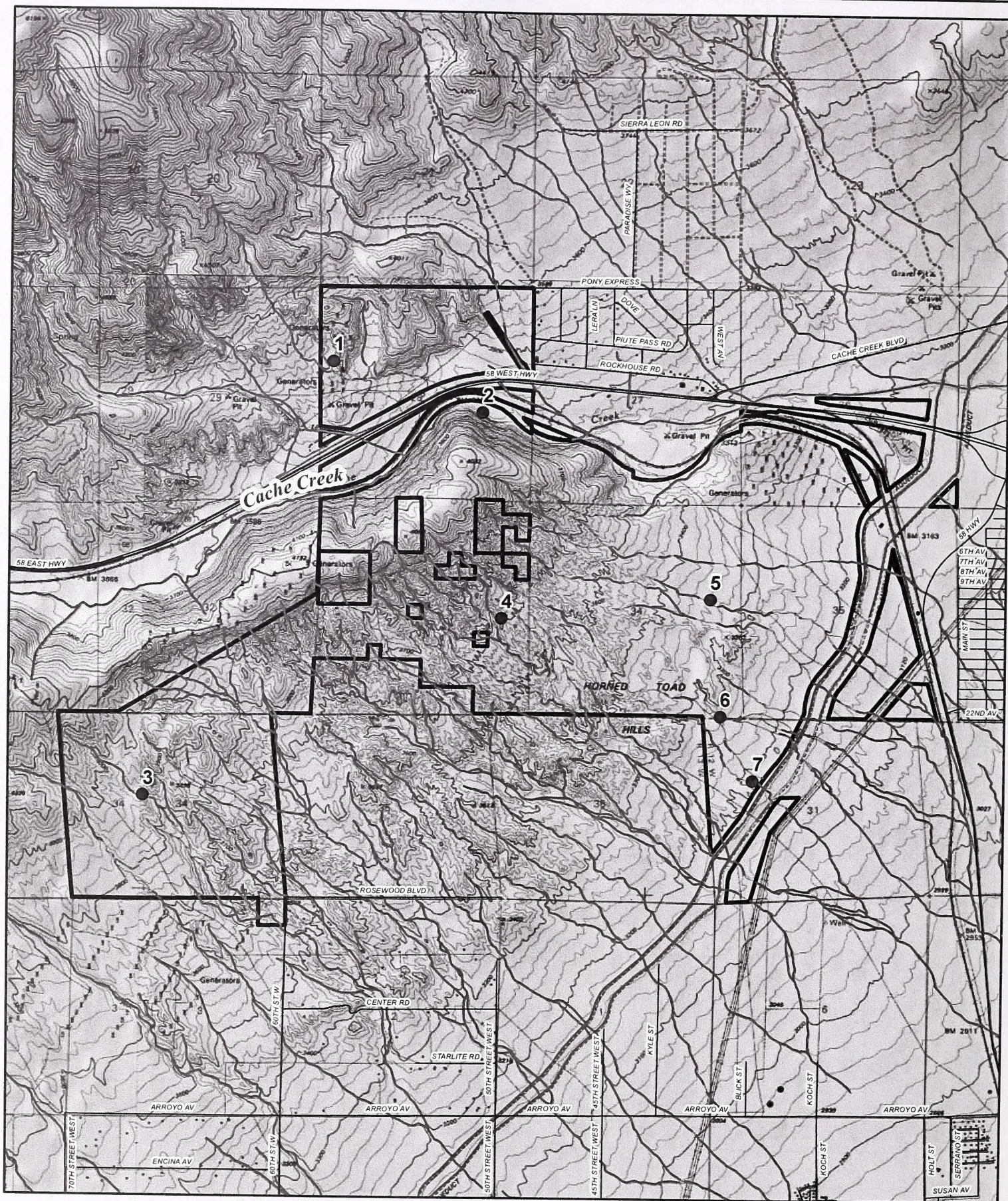


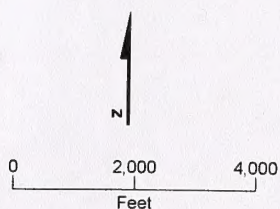
Figure 4
Stream Crossings
Alta East Wind Energy Project
Kern County, California

Attachment
Representative Stream Crossing Photographs



LEGEND

- Photo Locations
- Kern County Road
- NHD Streamline
- ▭ Project Area



Overview

Alta East Wind Energy Project
Kern County, California



Photo Location 1. Delineated drainage feature, north of Hwy. 58.
Approximate elevation 3,704 feet.

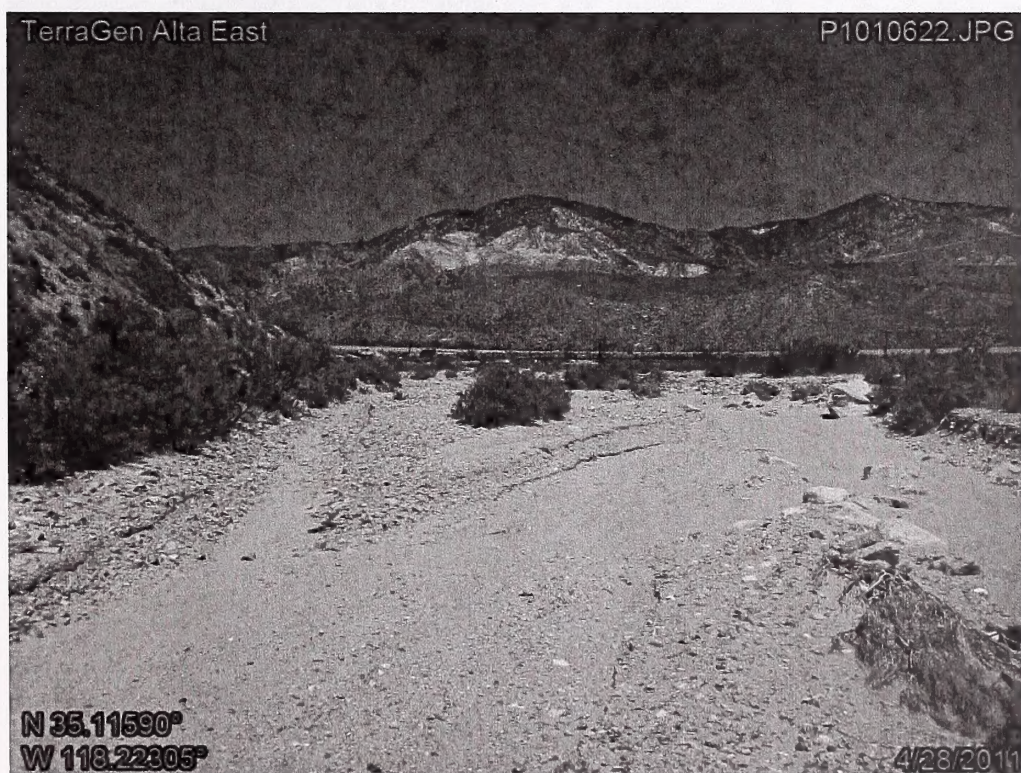


Photo Location 2. Delineated drainage feature, Cache Creek, south of
Hwy. 58. Approximate elevation 3,423 feet.



Photo Location 3. Delineated drainage feature showing OHV use, southwest side of Project. Approximate elevation 3,841 feet.

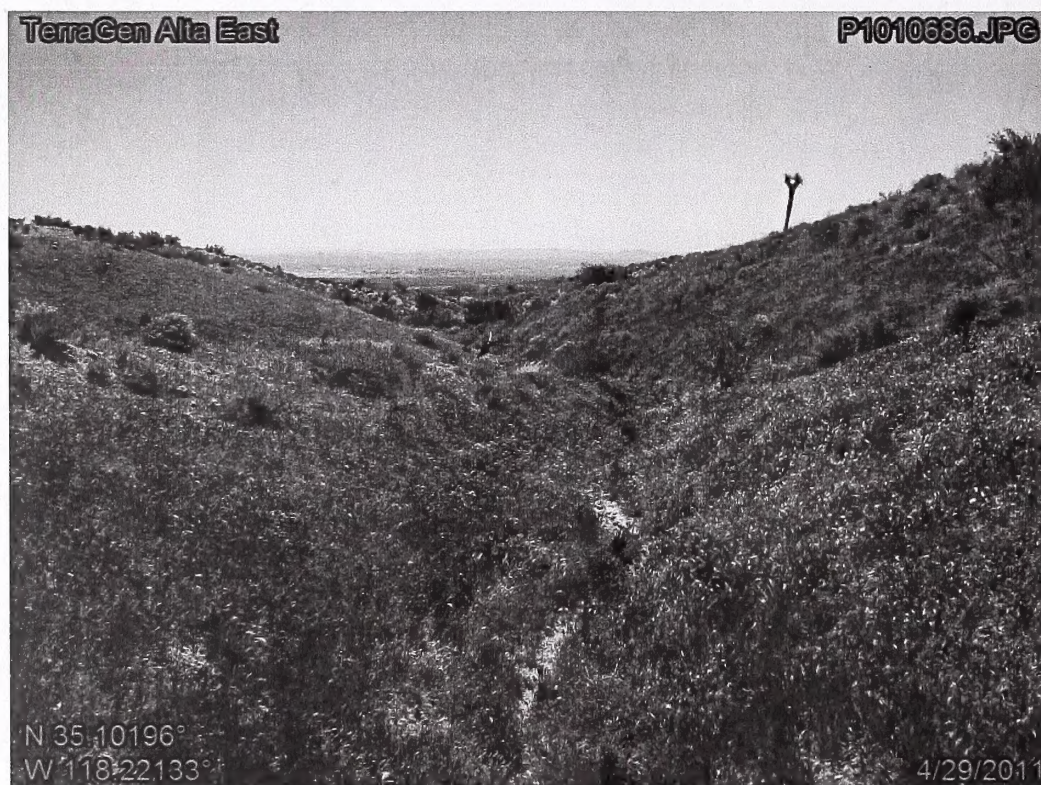


Photo Location 4. Delineated drainage feature, south central Project area. Approximate elevation 3,596 feet.



Photo location 5. Delineated drainage feature, east side of Project site.
Approximate elevation 3,337 feet.



Photo location 6. Delineated drainage feature, southeast Project area.
Approximate elevation 3,260 feet.



Photo location 7. Delineated drainage along transmission line, southeast Project area. Approximate elevation 3,192 feet.



Appendix J

Notice of Preparation and Initial Study

DATE: 10/15/2011

TO: Attached Mailing List

FROM: Planning and Community
Development Department
Attn: Josephine Rodriguez
1000 N. G Street, 4th Floor
San Jose, CA 95131
(408) 298-1000

ANNOUNCING NOTICE OF PREPARATION/NOTICE OF INTENT OF A DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT

The City of San Jose Planning and Community Development Department is pleased to announce that it is preparing a Draft Environmental Impact Report (EIR) and a Draft Environmental Impact Statement (EIS) for the proposed San Jose City Center Project. The EIR and EIS will be prepared in accordance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

The EIR and EIS will describe the project and its impacts on the environment and the community. The EIR will also describe the measures that will be taken to avoid, minimize, and compensate for the impacts of the project.

The EIR and EIS will be available for public review and comment. The public will have the opportunity to provide input on the project and its impacts.

PROJECT TITLE: 1000 N. G Street, 4th Floor, San Jose City Center Project. The project is located at 1000 N. G Street, 4th Floor, San Jose, CA 95131. The project is a multi-story office building that will provide space for the City of San Jose's various departments.

PROJECT LOCATION: The project is located at 1000 N. G Street, 4th Floor, San Jose, CA 95131. The project is situated in the heart of the city, near the San Jose Convention Center and the San Jose Civic Center.

PLANNING AND COMMUNITY
DEVELOPMENT DEPARTMENT
Lorelei H. Oviatt, AICP, Director
2700 "M" STREET, SUITE 100
BAKERSFIELD, CA 93301-2323
Phone: (661) 862-8600
FAX: (661) 862-8601 TTY Relay 1-800-735-2929
E-Mail: planning@co.kern.ca.us
Web Address: www.co.kern.ca.us/planning



DEVELOPMENT SERVICES AGENCY

Ted James, AICP, DSA DIRECTOR

Planning and Community Development
Engineering, Surveying and Permit Services
Roads Department

NOTICE OF PREPARATION

DATE: July 15, 2011

TO: See Attached Mailing List

FROM: Kern County Planning and Community
Development Department
Attn: Jacquelyn Kitchen, Planner III
2700 "M" Street, Suite 100
Bakersfield, CA 93301
(661) 862-8619; KitchenJ@co.kern.ca.us

**SUBJECT: NOTICE OF PREPARATION/ NOTICE OF INTENT OF A DRAFT
ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT.**

The Kern County Planning and Community Development Department as Lead Agency (per CEQA Guidelines Section 15052) and the U.S. Bureau of Land Management (BLM), as the federal Lead Agency, will direct the preparation of a joint Environmental Impact Report (per CEQA Guidelines Section 15161) and an Environmental Impact Statement (EIS), referred to as an EIR/EIS, for the Alta East Wind Project proposed by Alta Windpower Development, LLC (Project Proponent). The EIR/EIS will be prepared to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

The Planning and Community Development Department solicits the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval of projects.

Due to the limits mandated by State and Federal law, your response must be received by **August 15, 2011 at 5pm.** In addition, comments can be submitted at a **scoping meeting** that will be held at the Mojave Veterans Hall for **August 4, 2011 at 7:00 pm.** The Mojave Veterans Hall is located at 15580 O Street in Mojave, CA.

PROJECT TITLE: JRK 01-11; Alta East Wind Energy Project by Alta Windpower Development, LLC. (PP11212); General Plan Amendment 2, Zone Map 168; General Plan Amendment 2, Zone Map 168-27; General Plan Amendment 3, Zone Map 179; General Plan Amendment 1, Zone Map 180; Zone Change Case 10, Map 168; Zone Change Case 4, Map 168-27; Zone Change Case 3, Map 179; Zone Change Case 6, Map 180; Zone Change Case 47, Map 197; Conditional Use Permit No. 7, Map 168.

PROJECT LOCATION: The project is located 2 miles west of the intersection of Highway 58 and Highway 14 in the Mojave Desert and is within the Tehachapi Wind Resource Area (TWRA) of eastern Kern County; Located within in San Bernardino Base Meridian and Township 11 North, Range 13 West, Section 3; Township 12 North, Range 13 West, Section 34, Township 12 North, Range 12 West, Section 31, Township 32 South, Range 35 East, Sections 26-28, 32-35.

PROJECT DESCRIPTION: The project is a renewable energy development that would generate up to 360 megawatts (MW) of electricity through the use of wind power on a 3,200-acre project site. The project proponent is requesting: (a) a change in zone classification from the E (20) (Estate 20 acres) District and the A-1 (Limited Agriculture) District to the A (Exclusive Agriculture) District, to the A WE (Exclusive Agriculture, Wind Energy Combining) District and to the A FP (Exclusive Agriculture, Floodplain Combining) District in Map 168, (b) a change in zone classification from A-1 to A and A WE in Map 180, (c) a change in zone classification from E (20) to A and A WE in Map 180, (d) a change in zone classification from A-1 to A and A WE in Map 179, (e) a change in zone classification from A-1 to A in Map 197, (f) amendments to the Kern County General Plan to eliminate section and mid-section line road reservations within Maps 168, 168-27, 179, and 180, and (g) a conditional use permit to allow for the use of a temporary concrete batch plant during construction of the wind energy facility. The requested applications would also permit construction of wind ancillary facilities and supporting infrastructure, and a concrete batch plant to provide concrete and materials for turbine, substation, and building foundations. Permanent facilities would include up to 120 wind turbine generators, service roads, a power collection system, communication cables, overhead and underground transmission lines, electrical switchyards, project substations, meteorological towers, and operations & maintenance facilities.

Signature: /s/

Name: Jacquelyn R. Kitchen, Planner III

DISTRIBUTION LIST

Alta East Wind Project PP11212 I:\WP\LABELS\eir01-11jk.nop.doc jc (4/7/11)	City of Tehachapi 115 South Robinson Street Tehachapi, CA 93561-1722	U.S. Bureau of Land Management Ridgecrest Field Office 300 South Richmond Road Ridgecrest, CA 93555
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So. San Joaquin Valley Arch Info Ctr California State University of Bkfd 9001 Stockdale Highway Bakersfield, CA 93311	Caltrans/Dist 6 Planning/Land Bank Bldg. P.O. Box 12616 Fresno, CA 93778	Caltrans/Dist 9 Planning Department 500 South Main Street Bishop, CA 93514
Caltrans/ Division of Aeronautics, MS #40 P.O. Box 942873 Sacramento, CA 94273-0001	State Clearinghouse Office of Planning and Research P.O. Box 3044 Sacramento, CA 95812-3044 CERTIFIED MAIL	State Dept of Conservation Director's Office 801 "K" Street, MS 24-01 Sacramento, CA 95814-3528
State Dept of Conservation Division of Oil & Gas 4800 Stockdale Highway, Ste 417 Bakersfield, CA 93309	State Dept of Fish & Game 1234 East Shaw Avenue Fresno, CA 93710	California Regional Water Quality Control Board/Lahontan Region 14440 Civic Drive, Suite 200 Victorville, CA 92392-2306
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Mojave, CA 93501

Kern High School Dist
5801 Sundale Avenue
Bakersfield, CA 93309

Kern County Superintendent of Schools
Attention Mary Baker
1300 17th Street
Bakersfield, CA 93301

Mojave Public Utility Dist
15844 "K" Street
Mojave, CA 93501

Antelope Valley-East Kern
Water Agency
6500 West Avenue N
Palmdale, CA 93551

Kern County Water Agency
P.O. Box 58
Bakersfield, CA 93302-0058

East Kern Air Pollution
Control District

Mojave Airport
1434 Flightline
Mojave, CA 93501

East Kern Airport Dist
Attention Stuart Witt
1434 Flightline
Mojave, CA 93501

East Kern Airport Dist Engineer
3900 Ridgemoor Avenue
Bakersfield, CA 93306

Northcutt and Associates
4220 Poplar Street
Lake Isabella, CA 93240-9536

Adams, Broadwell, Joseph & Cardozo
Attention: Janet M. Laurain
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

U.S. Air Force
Western Regional Environmental Officer
50 Fremont Street, Suite 2450
San Francisco, CA 94105-2230

U.S. Army
Dir of Public Works/Master Plan Div
P.O. Box 105097
Fort Irwin, CA 92310-5097

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Dublin, CA 94568

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1220 Pacific Highway, Bldg 127
San Diego, CA 92132

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Patrick Christman
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926 Citrus Avenue
Los Angeles, CA 90036-4929

Center on Race, Poverty
& the Environmental
47 Kearny Street, Suite 804
San Francisco, CA 94108-5528

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Mojave Chamber of Commerce P.O. Box 999 Mojave, CA 93502	Native American Heritage Council of Kern County/Fay Van Horn P.O. Box 1507 Bakersfield, CA 93302	Beth Boyst Pacific Crest Trail Program Manager 1323 Club Drive Vallejo, CA 94592
Anitra Kass Pacific Crest Trail Association P.O. Box 3398 Idyllwild, CA 92549	Brendan Taylor Pacific Crest Trail Association 645 East Ridgecrest Blvd, Apt B Ridgecrest, CA 93555	Pacific Gas & Electric Co Land Dept 1918 "H" Street Bakersfield, CA 93301
Sheppard Mullin Attn: Kendra Joy Casper 333 South Hope Street Los Angeles, CA 90071	Sierra Club/Kern Kaweah Chapter Arthur Unger ***PUT IN BUCKET***	Southern California Edison Planning Dept. 421 West "J" Street Tehachapi, CA 93561
Southern California Gas Co 1510 North Chester Avenue Bakersfield, CA 93308	Southern California Gas Co Transportation Dept 9400 Oakdale Avenue Chatsworth, CA 91313-6511	Verizon California, Inc. Attention Engineering Department 520 South China Lake Boulevard Ridgecrest, CA 93555
David Laughing Horse Robinson P.O. Box 1547 Kernville, CA 93238	Kern Valley Indian Council Attn: Bob Robinson P.O. Box 1010 Lake Isabella, CA 93240	Kern Valley Indian Council Historic Preservation Office P.O. Box 401 Weldon, CA 93283
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Horizon Wind Energy Charlie Turlinski 1600 Shattuck Avenue, Suite 222 Berkeley, CA 94709	Nautilus Solar Paul Steinway P.O. Box 188 Fort Lupton, CO 80621	First Solar Rick Williams 18300 Von Karman Ave, Ste 930 Irvine, CA 92612

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Winters, CA 95694

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Frazier Park, CA 93222

Eight Bar Ranch
Jon and Helen Lantz
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Mojave, CA 93501

Native American Heritage Council
of Kern County/Fay Van Horn
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Bakersfield, CA 93302

Joyce LoBasso
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Bakersfield, CA 93386

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Planning Department
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Sarah Adams
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Portland, OR 97201

Frank Flores
Northrop Grumman Corporation
1 Northrup Grumman Avenue
El Segundo, CA 90245

Adams, Broadwell, Joseph & Cardozo
Attention: Janet M. Laurain
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # _____

Project Title: JRK 01-11 Alta East Wind Energy Project by Alta WindPower, LLC.

Lead Agency: Kern County Planning Department

Contact Person: Jacquelyn R. Kitchen

Mailing Address: 2700 "M" Street Suite 100

Phone: (661) 862-8619

City: Bakersfield

Zip: 93301-2323

County: Kern

Project Location: County: Kern

City/Nearest Community: City of Tehachapi

Cross Streets: 2 miles west of the intersection of Highway 58 and Highway 14 in the Mojave Desert

Zip Code: 93501

Lat. / Long.: 35° 5' 4" N / 118° 14' 3" W

Total Acres: 3200

Assessor's Parcel No.: Multiple

Section: Multiple

Twp.: Multiple

Range: Multiple

Base: SBB&M

Within 2 Miles: State Hwy #: SR 58 & SR 14

Waterways: Los Angeles Aqueduct

Airports: Mojave Airport

Railways: n/a

Schools: Mountain View Cont.

Document Type:

CEQA: ☒ NOP
☐ Early Cons
☐ Neg Dec
☐ Mit Neg Dec

☐ Draft EIR
☐ Supplement/Subsequent EIR
(Prior SCH No.) _____
Other _____

NEPA: ☒ NOI
☐ EA
☐ Draft EIS
☐ FONSI

Other: ☐ Joint Document
☐ Final Document
☐ Other _____

Local Action Type:

☐ General Plan Update
☐ General Plan Amendment
☐ General Plan Element
☐ Community Plan

☐ Specific Plan
☐ Master Plan
☐ Planned Unit Development
☐ Site Plan

☒ Rezone
☐ Prezone
☒ Use Permit
☐ Land Division (Subdivision, etc.)

☐ Annexation
☐ Redevelopment
☐ Coastal Permit
☐ Other _____

Development Type:

☐ Residential: Units _____ Acres _____
☐ Office: Sq.ft. _____ Acres _____ Employees _____
☐ Commercial: Sq.ft. _____ Acres _____ Employees _____
☐ Industrial: Sq.ft. _____ Acres _____ Employees _____
☐ Educational _____
☐ Recreational _____

☐ Water Facilities: Type _____ MGD _____
☐ Transportation: Type _____
☐ Mining: Mineral _____
☒ Power: Type Wind MW 360
☐ Waste Treatment: Type _____ MGD _____
☐ Hazardous Waste: Type _____
☐ Other: _____

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Other _____
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities

☒ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☐ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☐ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation

☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Wildlife
☐ Growth Inducing
☒ Land Use
☒ Cumulative Effects

Present Land Use/Zoning/General Plan Designation:

Zoned: A-1 (Limited Agriculture) and E 20 (Estate Residential, 20 acres) Designated: 1.1 (State or Federal Land); 8.3 (Extensive Ag, 20 acre min); 8.4 (Mineral and Petroleum, Minimum 5 Acre Size); 8.5 (Resource Management, min 20 acre); 1.1/2.4 (Steep Slope); 8.4 /2.4; 8.5 /2.4; 8.5/2.5 (Flood Hazard)

Project Description: (please use a separate page if necessary) The Kern County Planning and Community Development Department as Lead Agency (per CEQA Guidelines Section 15052) and the U.S. Bureau of Land Management (BLM), as the federal Lead Agency, will direct the preparation of a joint Environmental Impact Report (per CEQA Guidelines Section 15161) and an Environmental Impact Statement (EIS), referred to as an EIR/EIS, for the Alta East Wind Project proposed by Alta Windpower Development, LLC (Project Proponent). The EIR/EIS will be prepared to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

The project is a renewable energy development that would generate up to 360 megawatts (MW) of electricity through the use of wind power on a 3,200-acre project site. The project proponent is requesting: (a) a change in zone classification from the E (20) (Estate 20 acres) District and the A-1 (Limited Agriculture) District to the A (Exclusive Agriculture) District, to the A WE (Exclusive Agriculture, Wind Energy Combining) District and to the A FP (Exclusive Agriculture, Floodplain Combining) District in Map 168, (b) a change in zone classification from A-1 to A and A WE in Map 180, (c) a change in zone classification from E (20) to A and A WE in Map 180, (d) a change in zone classification from A-1 to A and A WE in Map 179, (e) a change in zone classification from A-1 to A in Map 197, (f) amendments to the Kern County General Plan to eliminate section and mid-section line road reservations within Maps 168, 168-27, 179, and 180, and (g) a conditional use permit to allow for the use of a temporary concrete batch plant during construction of the wind energy facility. The requested applications would also permit construction of wind ancillary facilities and supporting infrastructure, and a concrete batch plant to provide concrete and materials for turbine, substation, and building foundations. Permanent facilities would include up to 120 wind turbine generators, service roads, a power collection system, communication cables, overhead and underground transmission lines, electrical switchyards, project substations, meteorological towers, and operations & maintenance facilities.

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

☒ Air Resources Board	☐ Office of Emergency Services
☐ Boating & Waterways, Department of	☐ Office of Historic Preservation
☒ California Highway Patrol	☐ Office of Public School Construction
☐ CalFire	☐ Parks & Recreation
☒ Caltrans District # <u>6 & 9</u>	☐ Pesticide Regulation, Department of
☐ Caltrans Division of Aeronautics	☒ Public Utilities Commission
☐ Caltrans Planning (Headquarters)	☒ Regional WQCB # <u>Lahontan</u>
☐ Central Valley Flood Protection Board	☐ Resources Agency
☐ Coachella Valley Mountains Conservancy	☐ S.F. Bay Conservation & Development Commission
☐ Coastal Commission	☐ San Gabriel & Lower L.A. Rivers and Mtns Conservancy
☐ Colorado River Board	☐ San Joaquin River Conservancy
☐ Conservation, Department of	☐ Santa Monica Mountains Conservancy
☐ Corrections, Department of	☐ State Lands Commission
☐ Delta Protection Commission	☐ SWRCB: Clean Water Grants
☐ Education, Department of	☐ SWRCB: Water Quality
☒ Energy Commission	☐ SWRCB: Water Rights
☒ Fish & Game Region # <u>Fresno</u>	☐ Tahoe Regional Planning Agency
☒ Food & Agriculture, Department of	☐ Toxic Substances Control, Department of
☐ General Services, Department of	☐ Water Resources, Department of
☐ Health Services, Department of	
☐ Housing & Community Development	☐ Other _____
☒ Integrated Waste Management Board	☐ Other _____
☒ Native American Heritage Commission	

Local Public Review Period (to be filled in by lead agency)

Starting Date July 15, 2011 Ending Date August 15, 2011

Lead Agency (Complete if applicable):

Consulting Firm: _____	Applicant: _____
Address: _____	Address: _____
City/State/Zip: _____	City/State/Zip: _____
Contact: _____	Phone: _____
Phone: _____	

Signature of Lead Agency Representative: _____ **Date:** 7/14/11

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.



Notice of Preparation

Of a Joint Environmental Impact Report/Environmental Impact Statement

And

Request for Scoping Comments

On the Preparation of an Environmental Impact Report/Environmental Impact Statement

FOR THE

Alta East Wind Project

July 15, 2011

TO: All Interested Parties

Subject

Kern County and the U.S. Bureau of Land Management (BLM) will direct the preparation of a joint Environmental Impact Report (EIR) and an Environmental Impact Statement (EIS) referred to as an EIR/EIS for the Alta East Wind Project proposed by Alta Windpower Development, LLC (Project Proponent). Kern County, as the lead agency under California law, and the BLM, as the federal lead agency will prepare a Draft and Final EIR/EIS to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

Summary of the Proposed Project

The proposed Alta East Wind Project would generate up to 360 megawatts (MW) of electricity through wind power. The proposed project includes up to 120 wind turbine generators, a substation, transmission interconnection to the Southern California Edison (SCE) Windhub Substation, access roads, and ancillary facilities. The proposed project area comprises 3,200 acres, 2,083 acres of which are on public land under the jurisdiction of the BLM three miles northwest of the unincorporated town of Mojave in southeastern Kern County, California. Please refer to the attached Initial Study for a more detailed description of the proposed project and maps of the proposed project area.

Because of potentially significant impacts on the environment, as identified in the attached Initial Study, Kern County and BLM will prepare a full-issue EIR/EIS. Note that this Notice of Preparation (NOP), attached Initial Study (IS), and all future project-related documents are available for review at the following location:

Kern County Planning and Community Development Department

2700 M Street, Suite 100
Bakersfield, CA 93301-2370
(661) 862-8600

Hours: 8 a.m. to 5 pm. (Monday through Friday)
<http://www.co.kern.ca.us/planning/noticeprep.asp>

The EIR/EIS Process

The proposed project is located on land administered by Kern County and the BLM. The Project Proponent requires various authorizations and permits from Kern County and the BLM to construct and operate the proposed project. In order to consider issuance of these authorizations and permits, and based on the proposed project's potential environmental impacts, Kern County will prepare an EIR pursuant to CEQA requirements and the BLM will prepare an Draft Plan Amendment (DPA) and EIS pursuant to the requirements of the Federal Land Policy and Management Act (FLPMA) and NEPA. Based on these requirements, a joint EIR/EIS will be prepared under the direction of both agencies to satisfy the permitting and decision-making requirements of each agency prior to project approval. CEQA and NEPA also require that the EIR/EIS development process include public notice of the proposed project and address concerns that the public has identified regarding the proposed project during a process referred to as public scoping. The issuance of this NOP/IS commences the EIR scoping process pursuant to CEQA requirements. The BLM will issue a separate Notice of Intent to prepare an EIS pursuant to NEPA requirements, which will be published in the Federal Register.

The analysis of the proposed project will result in the publication of a Draft EIR/EIS and a Final EIR/EIS. A comment period of a minimum of 90 days (per BLM requirements) will be allocated for the review of the Draft EIR/EIS. A notice of availability of the Draft EIR/EIS will be sent to the State Clearinghouse by Kern County and to the Federal Register by the BLM for publication. Kern County and the BLM will consider all comments on the Draft EIR/EIS and revise the document, as necessary, before issuing a Final EIR/EIS. The Final EIR/EIS will include responses to the comments received on the Draft EIR/EIS.

Proposed Scope of the EIR/EIS

The EIR/EIS will present the analysis of the environmental impacts of the proposed project and comparative environmental effects of the project alternatives and the No Project/No Action Alternative, and will identify mitigation measures for potentially significant impacts. The EIR/EIS will address all issue areas for which potentially significant impacts are anticipated. These issue areas are described further in the attached IS, and include:

- **Aesthetics.** Effects to visual resources from the presence of heavy construction equipment as well as operational impacts from large and highly-visible wind turbines.
- **Agricultural Resources.** Effects of conversion of agricultural land to non-agricultural use; changes to agricultural land use designations.
- **Air Quality.** Construction and operation emissions and effects, including the effects of on-site exhaust emissions from heavy-duty diesel and gasoline-powered construction equipment and the fugitive particulate matter from soil disturbing operations and sediment removal activities.
- **Biological Resources.** Effects on native habitat that supports special-status species; avian and bat collisions with wind turbines; degradation and fill of Waters of the State; and effects of noise and disturbance on nesting and foraging wildlife species.

- **Cultural Resources.** Effects of construction-related ground disturbance on recorded cultural resources sites and unknown sites that may exist in the project area.
- **Cumulative Impacts.** Contribution of the project to cumulative impacts to all environmental disciplines.
- **Geology and Soils.** Direct and indirect soils-and geologic-related impacts resulting from the proposed project; geological hazards; and erosion due to ground-disturbing activities.
- **Greenhouse Gas Emissions.** Effects of greenhouse gas emissions from use of conventional construction equipment and vehicles during construction and potential emission offsets from renewable energy generation.
- **Hazards and Hazardous Materials.** Effects of construction activities on the mobilization of potentially contaminated soil; migration of contaminants via surface water runoff; and displacement of contaminants; soil contamination from equipment leaks or spills during construction; and effects of disposal activities.
- **Hydrology and Water Quality.** Impacts from erosion and sedimentation; hydrological impacts; stormwater runoff.
- **Land Use and Public Recreation.** Construction and operational effects on adjacent land uses and recreational resources; access disruptions; consistency with the Kern County General Plan.
- **Mineral Resources.** Effects from preclusion of access for extraction of valuable or locally-important mineral resources if present within the project area.
- **Noise.** Effects of construction and operation activities on sensitive receptors, such as rural residences and recreational uses.
- **Population and Housing.** Effects of population growth, potential displacement of existing housing, and increased demand for construction of additional housing.
- **Public Services.** Effects on fire and police protection, parks, schools, or other public facilities due to any population increases during construction and/or operation.
- **Socioeconomics and Environmental Justice.** Impacts on the population (including potential disproportionate impacts to low-income and minority populations), employment, and housing communities in the study area caused by non-local project workers; and any potential impact from project-induced population growth.
- **Transportation and Traffic.** Effects of heavy-duty truck traffic from construction activities on travel and traffic lanes, driveways, access points, and service vehicles.
- **Utilities and Service Systems.** Effects on demand for public services and utilities from construction and sediment removal activities; and potential for conflicts with collocated utilities.

Project Scoping Process and Scoping Meeting

The EIR/EIS for the Alta East Wind Project will focus on significant environmental effects. The process of determining the focus and content of the EIR/EIS is known as scoping under both CEQA and NEPA. Scoping helps to identify the range of actions, alternatives, environmental effects, and mitigation measures to be analyzed in depth, and eliminates from detailed study those issues that are not pertinent to the final decision on the proposed project. Scoping is also an effective way to bring together and address the concerns of the public, affected agencies, and other interested parties. Significant issues may be identified through public and agency comments.

Scoping, however, is not conducted to resolve differences concerning the merits of the project or to anticipate the ultimate decision on the proposal. Rather, the purpose of scoping is to help ensure that a comprehensive and focused EIR/EIS will be prepared that provides a firm basis for the decision-making process. Members of the public, affected federal, State, and local agencies, interest groups, and other interested parties may participate in the scoping process for this project by providing written and verbal comments or recommendations concerning the issues to be analyzed in the EIR/EIS. Comments can be given verbally by attending the scheduled scoping meeting. For the date, time, and location of the EIR/EIS scoping meeting, please see the cover letter to this NOP/IS packet or visit the Kern County project website at: <http://www.co.kern.ca.us/planning/noticeprep.asp>.

Written comments must be sent by no later than **August 15, 2011** to:

Mr. Jeff Childers
Planning & Environmental Coordinator
CDDO - RECO
Bureau of Land Management
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

and

Ms. Jacquelyn Kitchen
Planner III
Kern County Planning and
Community Development Department
2700 M Street
Bakersfield, CA 93301

By Electronic Mail: E-mail communications are welcome; however, please remember to include your name and return address in the email message. E-mail messages should be sent to **AltaEast@BLM.gov** and **KitchenJ@co.kern.ca.us**.

Agency Comments

This NOP has been sent to State responsible and trustee agencies, cooperating federal agencies, the State Clearinghouse, and the Federal Register. We need to know the views of your agency regarding the scope and content of the environmental information to be included in the EIR/EIS, which reflects your agency's statutory responsibilities in connection with the proposed project. Once again, responses should identify the issues to be considered in the Draft EIR/EIS, including significant environmental issues, alternatives, mitigation measures, and whether the responding agency will be a responsible State or cooperating federal agency or a State trustee agency. Due to the time limits mandated by State and federal Laws, your response must be sent at the earliest possible date but no later than 30 days (August 15, 2011) after receipt of this notice.

INITIAL STUDY/NOTICE OF PREPARATION

Alta East Wind Project
by Alta Windpower Development, LLC

General Plan Amendment 2, Map 168;
General Plan Amendment 2, Map 168-27;
General Plan Amendment 3, Map 179;
General Plan Amendment 1, Map 180;
Zone Change Case 10, Map 168
Zone Change Case 4, Map 168-27
Zone Change Case 3, Map 179
Zone Change Case 6, Map 180
Zone Change Case 47, Map 197
Conditional Use Permit No. 7, Map 168

(PP11212)

LEAD AGENCY:



Kern County Planning and Community Development Department

2700 M Street, Suite 100
Bakersfield, CA93301-2370

Contact: Ms. Jacquelyn Kitchen
(661) 862-8619
Kitchenj@co.kern.ca.us

July 2011



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1.1 PROJECT LOCATION

The project site is located on land that is subject to the jurisdiction of Kern County and to the U.S. Bureau of Land Management (BLM); therefore, Kern County and the BLM will direct the preparation of a joint Environmental Impact Report (EIR) and an Environmental Impact Statement (EIS) referred to as an EIR/EIS for the Alta East Wind Project proposed by Alta Windpower Development, LLC (Project Proponent). Kern County, as the Lead Agency under California law, and the BLM, as the federal Lead Agency, will prepare a draft and final EIR/EIS to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

The Alta East Wind Project is located 2 miles west of the intersection of Highway 58 and Highway 14 in the Mojave Desert and is within the Tehachapi Wind Resource Area (WRA) of eastern Kern County (Figures 1 and 2). The project area comprises approximately 3,200 acres; 2,083 of which are on federal land under the jurisdiction of the BLM, and 1,117 acres of which are on private land under the jurisdiction of Kern County. The private land is under lease or ownership of Alta Windpower Development, LLC, the applicant, or the current owners have authorized the applicant to include their land within the project boundaries. The project is generally located at the base of the Tehachapi Mountains in the Western Mojave Desert. Elevations in the area range between 3,000 and 3,400 feet above mean sea level.

The nearest populated areas to the project site are the unincorporated town of Mojave, which is located 3 miles southeast, and the City of Tehachapi which is located 11 miles to the west (Figure 1). Primary operational access for the project would be gained from Highway 58 and additional access locations are currently being negotiated by the applicant.

The 2,083-acre portion of the site that is on BLM land is included in an existing BLM right-of-way (ROW) Type 3 Grant Application (CACA-052537) that is held by Alta Windpower Development, LLC (AWD or Applicant) or by a subsidiary of AWD's parent company, Terra-Gen Power.

The project is located entirely within the U.S. Geological Service 7.5 minute series, Mojave topographic quadrangle. The project is located in San Bernardino Base Meridian and Township 11 North, Range 13 West, Section 3; Township 12 North, Range 13 West, Section 34, Township 12 North, Range 12 West, Section 31, Township 32 South, Range 35 East, Sections 26-28, 32-35 of the 1973 Mojave, California 7.5' and the 1995 Monolith, California 7.5' U.S. Geologic Survey (USGS) quadrangle maps.

1.2 ENVIRONMENTAL SETTING

The project vicinity is generally characterized as a sparsely developed, rural area located on the eastern flank of the Tehachapi Mountains. Land uses in and around the project area consist of open space with scattered residences, off-highway vehicle use, and livestock grazing. The nearest populated area is located immediately northeast of the project area, in the outskirts of the unincorporated town of Mojave. Existing developments on the site include rights-of-way (ROWS) for underground pipelines, underground portions of the Los Angeles Aqueduct, Southern California Edison (SCE) power lines, Union Pacific Railroad (UPRR) railroad siding, which is a short stretch of railroad track used to store rolling stock or enable trains on the same line to pass, and a Los Angeles Department of Water and Power (LADWP) electric transmission line easement. The Cameron Ridge segment of the Pacific Crest Trail passes within one mile of the northwestern portion of the project area, north of State Route 58.

The project area encompasses land under the jurisdiction of the BLM or Kern County. BLM lands within the project area are classified as Multiple-Use Class L (Limited Use) pursuant to the California Desert Conservation Area (CDCA) Plan. Additionally, BLM lands in the project area are located within the Middle Knob Motorized Access Zone, as identified in the West Mojave Plan (WMP) amendment to the CDCA Plan. The project area is not within any Desert Wildlife Management Areas or Areas of Critical Environmental Concern (ACEC) established by the WMP or U.S. Fish and Wildlife Service-designated critical habitat. The project area is within the boundaries of the Kern County General Plan (KCGP),

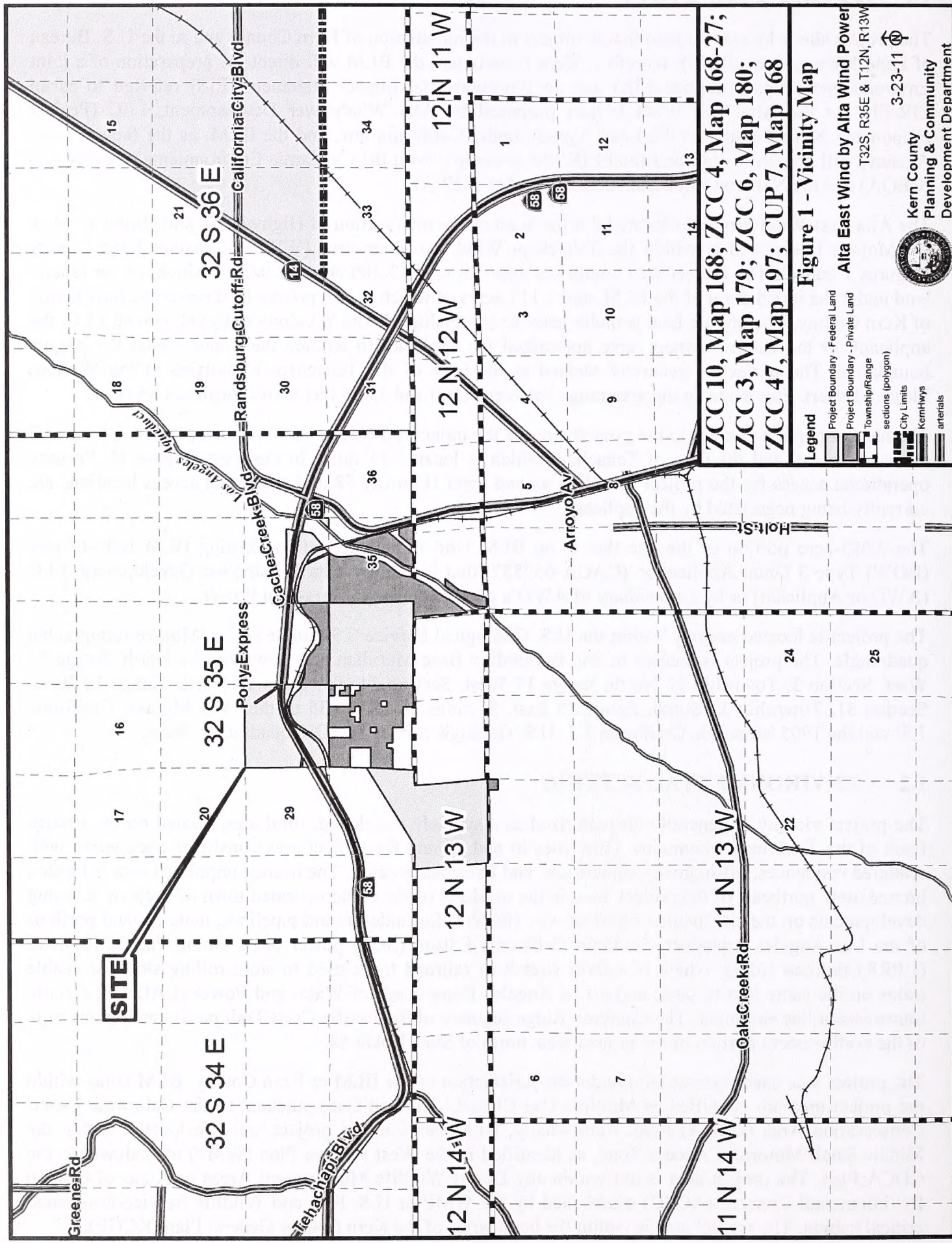




Table 1, *Project Site and Surrounding Land Uses*, shows the zoning and general plan designations for the project site and for the surrounding properties. The table references the Kern County General Plan (KCGP) and the Mojave Specific Plan (MSP).

Table 1. Project Site and Surrounding Land Uses

Location	Existing Land Use	Existing Map Code Designations	Existing Zoning Classification
Project Site	Vacant Land	<i>KCGP & MSP:</i> 1.1 (State or Federal Lands); 8.3 (Extensive Ag, 20 acre min); 8.4 (Mineral & Petroleum, min 5 acre); 8.5 (Resource Management, min 20 acre); 1.1/2.4 (Steep Slope); 8.4 /2.4; 8.5 /2.4; 8.5/2.5 (Flood Hazard)	• A-1 (Limited Agriculture); • E (20) (Estate, 20 acre)
North	Vacant Land, Scattered Residential, Small Commercial Area (Gas Station)	<i>KCGP & MSP:</i> 1.1; 8.5; 8.5/2.1 (Seismic Hazard); 8.5/2.4; 8.5/2.5 <i>Cache Creek Interim Rural Community Plan:</i> 5.5 (Min. 1 Acre/Dwelling Unit); 5.6 (Min. 2.5 Acres/Dwelling Unit); 5.8 (Min. 20 Acres/Dwelling Unit); 6.3 (Highway Commercial); 7.2 (Service Industrial)	• A (Exclusive Agriculture) • A-1; • A-1 FPS (A-1 with Floodplain Secondary); • E (1) (Estate, 1 acre) • E (2.5) (Estate, 2.5 acre) • E (2.5) MH (E 2.5 with Mobilehome Combining) • C-2 (General Commercial) • M-2 PD (Medium Industrial, with Precise Development Combining)
South	Wind Farms, Vacant Land, Scattered Residential	<i>KCGP & MSP:</i> 1.1; 3.3 (Other Facilities); 5.7 (Min 5 Acres/Dwelling Unit)/2.4; 8.3; 8.3/2.4; 8.4/2.4; 8.5, 8.5/2.1 (Seismic Hazard); 8.5/2.4; 8.5/2.5	• A WE (A with Wind Energy Combining) • A-1 • E (20)
East	Vacant Land, Scattered Residential	<i>MSP:</i> 1.1; 3.3; 8.5, 8.5/2.4; 8.5/2.5	• A-1 • A-1 H (A-1 with Airport Approach Height Combining) • PL H (Platted Lands)
West	Wind Farms, Vacant Land, Scattered Residential	<i>KCGP:</i> 1.1; 8.5; 8.5/2.1; 8.5/2.4; 8.5/2.5	• A WE • A-1 • E (20)

The Alta East Wind Project site has not been designated by the California Department of Conservation (CDC) as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. The project area comprises two CDC land-use designations: Grazing Land; and Non-agriculture and Natural Vegetation. The project is not located on lands that are under a Williamson Act contract.

The project is located near several public, private, and military airport facilities; however, the turbine layout would not be within the boundaries of the Kern County Airport Land Use Compatibility Plan (ALUCP). The southeastern portion of the project is 2.5 miles away from the Mojave Air and Space Port, and is subject to Airport Influence Area "C" according to the ALUCP. The California City Municipal Airport is located 10 miles east of the project site. The project is within the Mojave Air Basin and the Antelope Valley Groundwater Basin.

Surrounding Land Uses

The project is proposed to be located on 3,200 acres on the north and south sides of State Route (SR) 58 in southeastern Kern County, California, within an area of existing wind development. There are several



existing, permitted, and proposed wind energy and transmission projects proximate to the project, including the Alta-Oak Creek Mojave Wind Project, the 300-megawatt (MW) and 151-MW Pacific Wind Projects, the Catalina Renewable Energy Project, the Rising Tree Wind Project, and SCE's Tehachapi Renewable Transmission Line Project (TRTP).

1.3 PROJECT DESCRIPTION

The Alta East Wind Project would generate up to 360 MW of electricity through wind power. The project includes up to 120 wind turbine generators (WTGs or turbines), a substation, transmission interconnection, access roads, and ancillary facilities. As described above, the project area comprises 3,200 acres; however, the total wind energy development area (on both Private and BLM land) is anticipated to cover approximately 2,430 acres onsite, and only a portion of wind energy development area would be temporarily or permanently disturbed. Two proposed wind turbine layouts (Figure 2) and two transmission line options (Figure 6) have been identified by the applicant.

Table 2. Project Statistics

Total Project Boundary	Private Land	BLM Land	Proposed WE Zoning	Total Wind Development	Max No. of WTGs	Max. MWs
3,200 acres	1,117 acres	2,083 acres	680 acres	2,431 acres	120 WTGs	360 MW

Specifically, the project applicant is requesting: (a) a change in zone classification from the E (20) (Estate 20 acres) District and the A-1 (Limited Agriculture) District to the A (Exclusive Agriculture) District, to the A WE (Exclusive Agriculture, Wind Energy Combining) District and to the A FP (Exclusive Agriculture, Floodplain Combining) District in Map 168, (b) a change in zone classification from A-1 to A and A WE in Map 180, (c) a change in zone classification from E (20) to A and A WE in Map 180, (d) a change in zone classification from A-1 to A and A WE in Map 179, (e) a change in zone classification from A-1 to A in Map 197, (f) amendments to the Kern County General Plan to eliminate section and mid-section line road reservations within Maps 168, 168-27, 179, and 180, and (g) a conditional use permit to allow a temporary concrete batch plant during construction of the wind energy facility. The requested applications would also permit the construction of wind ancillary facilities and supporting infrastructure, as well as a concrete batch plant that is necessary to provide concrete and materials for turbine, substation, and building foundations.

Figure 5 displays the areas proposed for rezoning to the A, A WE and A FP districts.

The purpose of the WE Combining District is to promote the use of an alternative to fossil fuel-generated electrical power in areas of the County that are identified to have suitable wind resources for production of commercial quantities of wind-generated electrical power. The WE Combining District contains specific development standards that apply to the associated construction and siting of WTGs and accessory facilities in the WE Combining District.

Inclusion of the Flood Plain (FP) Combining District is necessary for the portions of the project site located within the boundaries of a Zone A flood hazard area. The purpose of the FP Combining District is to protect public health and safety, and minimize property damage by designating areas that are potentially subject to flooding and by establishing reasonable restrictions on land use in such areas. The FP Combining District shall be applied to those areas lying within Zone A on the FEMA Flood Insurance Rate Maps (FIRM) or those areas potentially subject to flooding as designated by the Kern County Engineering, Surveying and Permit Services Department, pending future reclassification of such areas into the Floodplain Primary (FPP) District or the Floodplain Secondary (FPS) Combining District. The regulation established by the FP Combining District shall be in addition to the regulations of the base district with which the FP Combining District is combined.



The project would be supported by a 230-kV overhead transmission corridor that would be up to 15 miles in length. The transmission line would generally be aligned from the northeast to the southwest where it ultimately would be connected to the existing SCE Windhub Substation. The project would include the construction of one substation facility on-site, which would collect the power generated and step-up voltage from the 34.5 kV collector system to 230 kV for transmission to the Windhub Substation.

Water would be provided to the project via a new on-site well or other water service (to serve the non-potable demands). The Operations and Maintenance (O&M) facility would utilize a septic system for sewage treatment. The O&M facility would also include approved hazardous waste containment for turbine oils and fuels, as required. Any water that is needed for construction (such as water for dust suppression) would be trucked in from nearby municipalities, such as those serving Mojave or Tehachapi, or be supplied by the new on-site well.

The project proponent executed two project-specific power purchase agreements for the Alta East Wind Project under their Master Power Purchase and Wind Project Development Agreement with Southern California Edison (SCE) for a total of 300 MW on April 30, 2010. Additionally, draft Large Generator Interconnection Agreements (LGIA) for interconnecting into Windhub Substation have been issued and are in the process of finalization. In addition, the project proponent submitted an "Application for Transportation and Utility Systems and Facilities on Federal Lands" (Standard Form 299) to BLM to address a ROW Grant on federal land as well as a project-specific CDCA (California Desert Conservation Area) Plan Amendment.

The Alta East Wind Project is assumed to have a lifespan of 30 years, based on landowner lease arrangements and permit approval timeframes. Decommissioning of the Project would require removal of the wind turbines, cables, and other infrastructure support facilities and land restoration in accordance with local, State, and federal regulations and/or landowners' contractual commitments. Repowering the project would require new environmental and permit/entitlement reviews and new landowner agreements to extend the project's operational period beyond 30 years.

1.4 PROJECT FACILITIES AND OPERATIONS

1.4.1 Project Components Overview

The project includes various components related to the generation and transmission of renewable energy. These are listed below and described in the following subsections.

- Up to 120 wind turbines not to exceed 500 feet in height with associated towers, foundations, and pad mounted transformers (each turbine up to 3 MW) for a total generation capacity up to 360 MW of electricity;
- Temporary construction staging and laydown areas to support the WTG component staging, office trailers, a concrete batch plant, portable rock crushers and equipment marshaling;
- Permanent access/service roads required for construction and operations and maintenance activities;
- One collector substation and underground and overhead electrical collection lines to collect energy from the WTGs;
- Operations and Maintenance (O&M) facility;
- Meteorological towers;
- From two potential route options, a single 230 kV transmission line to interconnect to the SCE Windhub Substation.



Wind Turbine Generators

The proposed turbines are utility-scale Vestas V90 or equivalent, capable of generating up to 3 MW of electricity each. Up to 120 WTGs would be arranged in rows in accordance with industry siting recommendations for optimum energy production and minimal land disturbance. Typically, WTGs are spaced 1.2 to 2.0 rotor diameters apart within rows and the rows are spaced 8 to 10 rotor diameters apart. Refer to Figure 2 for an illustration of the proposed WTG configuration options. The WTGs would be a horizontal-axis design, light gray color and non-reflective finish, which is consistent with the design requirements of the Kern County design guidelines specified in the WE Combining District. A WTG is composed of a tower, nacelle, hub, blades/rotor, controller, central Supervisory Control and Data Acquisition (SCADA) system for communication, transformer, braking system, safety lighting, and lightning protection system.

The total height of the WTG at the highest point of the rotor blade rotation would be 125 meters (410 feet). The ground clearance for the rotor blades at their lowest point of rotation is 35 meters (115 feet). The turbines are designed to withstand wind speeds in excess of 120 miles per hour, which exceeds recorded and projected maximum wind speeds at the project site.

Tower. The tower portion of the WTG consists of a tubular steel monopole that extends from the top of its concrete foundation at ground level to its connection with the nacelle. The tower supports the nacelle, hub, and three-bladed rotor and has internal access ladders for turbine maintenance. The total height of the tower to the hub of the rotor blades would be 80 meters (262 feet) tall on a 3-meter (10-foot) diameter base.

Nacelle. The nacelle is an aerodynamic welded steel and fiberglass structure atop the tower that contains the inner mechanical workings of the turbine, including the power-generating components. Power-generating components mounted within the nacelle would include main drive shaft/generator and the gearbox, electrical components/cabinets, and depending on the confirmed turbine size and make, the power transformer, which steps up the turbine voltage to the voltage level of the internal wind farm electrical distribution network. The nacelle also contains the blade pitch control (a system that controls the angle of the blades), a cooling system, and the yaw drive, which controls the position of the turbine relative to the wind.

Hub. The hub is the fixture for attaching the blades to the main drive shaft and is usually made from a large iron or steel casting. It would be located on the front of the nacelle and covered by a composite nose-cone structure to streamline the airflow and protect the equipment. The hub also contains the mechanisms that allow the blades to pitch in response to wind, temperature, and air density conditions.

Blades/Rotor. The WTGs would have three blades bolted to the hub; the blades and hub are collectively called the rotor. The proposed rotors are 90 meters (295 feet) in diameter. The blades are long, tapered, small-chord airfoils that resemble airplane wings and vary in thickness (thinnest at the tip and thickest where they attach to the hub) and use aerodynamic lift, similar to an airplane wing, to provide the driving force that spins the rotor. Each rotor would be equipped with a braking system to prevent rotors from dislocating from the turbine.

Controller/Communications. The controller is a microprocessor that automatically regulates operation of the WTG, including startup, shutdown, pitch control, yaw control, and safety monitoring. Information is communicated from the controller to the central O&M facility via fiber-optic cables or other means of communication such as radio-links. A central SCADA system will monitor data input from the controller to facilitate centralized operation and maintenance. If a control parameter deviates from its normal operating range, the controller would automatically shut down the WTG and notify the operating technician(s) of the fault. In many situations, the controller would analyze the data and restart the WTG if the fault were corrected or the operating conditions returned to normal. If the fault reoccurred, the controller might require a manual start.



Transformer. A step-up transformer would be either contained within the WTG unit or pad-mounted next to the WTG base. Transformers function to boost the voltage of the WTG (500 to 1,000 volts) to the collector system voltage of 34.5 kilovolts (kV) because the low voltage power generated by the WTG is not suitable for power transmission. Electricity from the transformer would be transmitted via underground collection system electrical cables to the project substation.

Safety Lighting. Safety lighting would be installed on the exterior of some of the nacelles in compliance with FAA rules. Specific requirements for the project would be developed in conjunction with the FAA based on the turbine heights and site-specific aviation conditions. On recent wind projects, white flashing lights were used during the daytime and red flashing lights were used at night to warn aviators away from the area; however, FAA rules have recently been revised and daytime lighting is no longer required. Lights are not required on every wind turbine; instead, they may be spaced every 1,000 feet and at the ends of turbine strings. Lighting on WTGs would be consistent with all FAA requirements.

Lightning Protection. For protection from potential lightning strikes, a lightning protection system would be installed on each WTG and connected to an underground grounding arrangement to facilitate lightning flowing safely to the ground. In addition, all equipment, cables, and structures comprising the wind turbines would be connected to a metallic project-wide grounding network.

Wind Turbine Foundations and Pad Areas

Each proposed WTG would be supported by a steel-reinforced concrete foundation. The project could include several proposed WTG foundation types depending on geotechnical constraints, wind pattern, and other factors onsite:

- **Patrick and Henderson Inc. (P&H) foundation.** This patented foundation type would be drilled or dug to approximately 15 to 35 feet deep, depending on geotechnical conditions and loadings, and would be approximately 18 feet in diameter. The foundation would be in the configuration of an annulus—two concentric steel cylinders. The central core of the smaller, inner cylinder would be filled with soil removed during excavation. In the cavity between the rings, bolts would be used to anchor the tower to the foundation, and the cavity would be filled with concrete. Bolting the tower to the foundation would provide post-tensioning to the concrete.
- **Rock anchor.** For each foundation, six to 20 holes, depending on geotechnical data, would be drilled approximately 35 feet into the bedrock, and steel anchors would be epoxy-grouted in place. A reinforced concrete cap containing the anchor bolts would be poured on the top of the steel anchors to support the tower structure.
- **Spread-footing.** This foundation would be square or octagonal and formed with reinforcing steel and concrete. Depending on geotechnical data, this type of foundation may be as large as 35 by 35 feet and 6 to 10 feet thick.

Total combined cut and fill volumes for the WTG foundations would be determined after site-specific geotechnical investigation. For all designs, the exposed concrete pad would be approximately 18 feet in diameter and extend less than 1 foot above grade.

Meteorological Towers

Meteorological towers were previously installed on the project site to measure and collect data necessary to properly assess project viability and determine optimum turbine layout. These towers support anemometers, wind direction sensors, and temperature and relative humidity gauges at the same height of the WTG rotor hubs to monitor wind and other climate data needed to support operations and help meet reporting obligations. Some of the larger towers already installed would remain as permanent towers and some additional permanent towers would be installed.



Power Collection and Transmission

Project electricity would be collected from each WTG through its associated transformer and transferred to a substation at the project site via the electrical collection system. The proposed 230/34.5-kV project substation will be constructed within the project site to minimize power losses in the collection system and would consist of the following components: (1) a control house, (2) electrical breakers, (3) one or more 230/34.5-kV transformers, (4) an overhead electrical bus connecting the various electrical apparatus, and (5) pole structures to support electrical conductors entering the substation. The actual capacity of the project substation would depend on the total number of WTGs that supply it power. The substation site would be graded to provide for stormwater drainage. A grounding grid would be installed to protect the substations against lightning and shorts. The substation would be built to Kern County building code requirements, and the site would be graveled and enclosed within a security fence.

At least one switchyard would be required for the project, which will collect power coming from the substation and consolidate the power onto high voltage (230 kV) overhead transmission lines. The switchyard would include the following main equipment: (1) a control room, (2) electrical breakers, (3) an overhead electrical bus connecting the various electrical apparatus, and (4) pole structures to support electrical conductors entering the switchyard.

Two transmission line route options have been identified by the project proponent to deliver project electricity to the SCE Windhub substation (Figure 6). Both proposed transmission line options would consist of up to 15 miles of aboveground 230-kv lines that would likely be installed on metal monopoles, with conductors on one side. Both transmission line route options A and B are shown on Figure 6.

Access and Maintenance Roads

No temporary roads are proposed. All roads designed for construction are planned to be retained and possibly narrowed for use during operations. Permanent maintenance roads would be constructed for use during operation to access project facilities for maintenance. Because of topography, grading of access roads would, in some limited cases, disturb an area of 40 to 125 feet on either side of the centerline to accommodate appropriate cut or fill slopes to allow for the necessary road width and to comply with percent slopes per Kern County grading requirements and manufacturer specifications of construction and installation equipment. Some roads intended for permanent use would be temporarily widened to 36 feet and engineered to support heavy cranes and delivery vehicles. Following completion of construction, the temporarily widened portions of these roads would be restored, leaving 20- to 24-foot-wide permanent maintenance roads.

Temporary Staging Areas and Temporary Concrete Batch Plants

The project would require up to three temporary construction laydown yards (see Figure 2) to stage construction equipment, construction contractor trailers, and the offloading and temporary storage of project equipment and materials. The lay-down areas would be cleared of vegetation and compacted to support the construction equipment. At the end of construction, up to three laydown areas may be retained for long-term parts and equipment storage. Those lay-down areas not retained for permanent use would be reclaimed and re-vegetated.

An on-site, temporary, concrete batch plant would be required to provide concrete and materials for the turbine and transformer foundations. The concrete batch plant would operate between approximately 7:00 a.m. and 7:00 p.m., Monday through Saturday for up to 6 months. All remnant materials and debris would be hauled off site and disposed of at a certified location. Operation of the temporary, concrete batch plant would require a Conditional Use Permit (CUP) from Kern County.



Permanent Operations and Maintenance Facility

One O&M Facility would be required for administration and maintenance of the Alta East Wind Project. The facility will be approximately 2 to 3 acres in size and have a foundation footprint of approximately 100 by 150 feet (building). The facility would include a main building with offices, SCADA system, control room, spare parts storage, restroom, shop area, outdoor parking facilities, lay-down area, a turn-around area for larger vehicles, outdoor lighting, and gated access with partial or full perimeter fencing as well as a small information center for visitors.

Security Fencing

Security fencing would be installed in accordance with Kern County zoning requirements, which allow either fencing the exterior boundary of the entire project property or each wind turbine cluster or row independently. At this time, it has not been determined which of these options would be used.

Security fencing consisting of new steel "T" posts would be installed at 10- to 15-foot intervals and with four strands of barbed wire a minimum of four feet high. The bottom strand of wire would be a minimum of 18 inches above ground. Signs warning of wind turbine dangers would be installed on all perimeter fencing at 300-foot intervals and at all points of ingress and egress. Fencing would not interfere with access to existing ROWs crossing the project area (e.g., transmission lines, railroad, gas pipelines, the Los Angeles Aqueduct, and public highways). Cattle guards may be installed in grazing areas.

Two types of gates would be installed:

- **Main access entrances** off county highways would consist of two 12-foot-wide swing gates, providing a 24-foot opening. The gates would be installed a reasonable distance off the highways to permit trucks delivering turbine components to pull completely off the highway before stopping to open the gate. The access areas would be graveled to prevent tracking of mud onto the paved highways.
- **Interior access gates** would provide access between the various fenced areas within the project site and would consist of one 10- to 16-foot-wide swing gate, wide enough to permit access for the normal maintenance vehicles and equipment. The post at the free end of the gate would be removable to permit the fence to be temporarily opened to 24 feet to allow access for large vehicles or cranes.

1.4.2 CONSTRUCTION SCENARIO

Construction of the project is anticipated to commence in the spring of 2012 and require 9 to 12 months to complete. The sequence of construction activities for the project would generally be site preparation, access road installation, WTG foundation construction, electrical collection system installation, collector substation construction, WTG installation, final testing and turbine commissioning, and cleanup and restoration.

Site Preparation

Preparation of the project site for construction would involve land clearing and grading by removing topsoil and vegetation for roads, WTGs, and the substation. Land clearing and grading would be performed according to the Soil Erosion and Sedimentation Mitigation Plan approved by Kern County, the project's Regional Water Quality Control Board-approved Stormwater Pollution Prevention Plan, and the grading and building permits issued by Kern County (see Table 1 in Section 1.6).

Access Road Installation

The first step in access road installation would be rough grading and leveling of proposed roadway areas. Then, base rock would be trucked in, spread, and compacted to create a road base. Capping rock would then be spread over the road base and roll-compacted to finished grade. At completion of heavy construction, the road would be re-graded to a width of 20 to 24 feet for service as a permanent maintenance road or restored to pre-project conditions, as appropriate. For permanent maintenance roads, a final pass



would be made with the grading equipment to level the road surfaces, and more capping rock would be spread and compacted in areas where needed. In some very steep areas, the road might be paved. Water bars, similar to speed bumps, would be cut into the roads in areas where needed, to allow for natural drainage of water over the road surface and to prevent road washout. V-ditches and culverts would be installed, where necessary, to handle excess drainage water. All road work would be performed under final approved grading, erosion control, and stormwater quality management plans. Excess excavated soil and rock would be disposed of onsite at approved disposal areas, such as eroded gullies and ravines. Larger excavated rocks also would be disposed of at approved sites or crushed and re-used onsite as backfill or roadway material.

Foundation Construction

Each WTG would have a concrete and steel reinforced foundation with permanent mounting pads. Each pad would extend approximately 10 to 15 feet in all directions beyond the edge of the turbine foundation and transformer pad; this open area would be maintained free of vegetation for safety and fire control. Depending on the foundation type used, each WTG foundation could require approximately 90 cubic yards of 4,000- to 6,000-pound-per-square-inch (psi) test concrete and 80 cubic yards of 1,000-pounds per square inch (psi) slurry mix, totaling approximately 18 to 20 truckloads of concrete per WTG from the on-site temporary concrete batch plant.

Foundation construction would include the following stages: drilling, blasting (if required, although not currently anticipated), and hole excavation; outer form setting; rebar and bolt cage assembly; concrete casting and finishing; removal of the forms; backfilling and compaction; construction of the transformer foundation pad; and foundation site area restoration.

Electrical Collection System Installation

After the roads, WTG foundations, and transformer pads are completed for a row of WTGs, underground electric cables would be installed along that road section. Trenches would be cut 3 to 5 feet deep for each cable circuit and electric cables would be laid in the trenches, surrounded with a cushion of clean fill, inspected, and the trenches backfilled. The 34.5 kV cables would be connected to the WTG pad-mounted transformers, and low-voltage wiring between the transformers and the bus cabinet inside the WTG towers would be completed, inspected, and tested.

In cases where the distance to the substation is excessive, or where terrain and/or obstacles dictate such, the underground cables may connect to an overhead collection system on wood or steel poles that would more efficiently transport the power to the project collection substation. As part of the final design engineering, a field survey would be conducted to determine the exact power pole locations for overhead collector lines, if required. Holes would be drilled and the poles erected with a small crane or boom truck. The poles would be set in place using concrete or compacted clean fill, according to the engineer's specifications. The overhead lines would be connected to the underground cables at each end through a fused disconnect switch, to ensure personnel safety.

Collector Substation Construction

Construction of the collector substation and interconnection facilities would involve several stages of work, including grading of the collector substation area; installation of a grounding mat; construction of several foundations for the transformers, power circuit breakers, and structures; erection and placement of the steel work and all outdoor equipment; and electrical work for all of the required terminations. The entire collector substation would be enclosed with a chain link security fence. Following construction, an inspection and commissioning test plan would be executed prior to the collector substation being energized.



Wind Turbine Generator Installation

Once adequate turbine pad sites and site roads are prepared, the individual WTG components, tower sections, nacelle, hub and rotor blades, would be shipped to the construction site in two to five sections. After setting the WTG electrical bus cabinet and ground control panels on the foundation, the tower would be erected by crane in sections. Tower construction would be followed by hoisting and installation of the nacelle; assembly, hoisting, and installation of the rotor; connection and termination of internal cables; and inspection and testing of the electrical system.

Water Supply and Usage

During construction, water use would be temporary and required for onsite mixing of concrete as well as for dust abatement activities. Any water that is needed for construction would likely be trucked in from nearby municipalities, such as Mojave or Tehachapi, or by a new on-site well. Operation of a wind energy facility requires very small amounts of water. Water for the O&M Building during operation would either be provided by a new on-site well, by purchase of water from the Tehachapi Cummings Valley Water District (TCVWD), or would be trucked in from off-site and stored adjacent to the building.

Final Testing and Turbine Commissioning

After construction, all project facilities, systems, controls, and safety equipment would be calibrated and tested before being commissioned to ensure compliance with required specifications and proper working order. Testing would be conducted by qualified technicians and electricians.

Cleanup and Restoration

After construction, preconstruction land contours at the project site would be restored to the extent feasible. All areas of temporary disturbance would be reseeded with a seed mixture appropriate to the Project site in accordance with Kern County or other regulatory agencies. All construction debris and waste would be removed from the site and disposed of at an appropriate location.

1.4.3 OPERATION AND MAINTENANCE

Upon completion of all construction activities, the project applicant would ensure that the facility would be properly operated and maintained. Up to 15 full-time and part-time staff, including wind turbine technicians, operations personnel, administrative personnel and managers, would be employed to operate and maintain the project. Staff would be responsible for implementing the project's Standard Operating Procedures, operating the SCADA system, and performing maintenance and repair work.

The applicant would develop an operations and maintenance protocol to be implemented throughout the life of the project. The protocol would specify routine turbine maintenance and operation, which typically adheres to the maintenance program developed by the turbine manufacturer. O&M personnel would conduct maintenance activities for each wind turbine required by the routine schedule provided by the turbine supplier or as required to keep the equipment in operation. On average, each turbine would require 40 to 50 hours of scheduled mechanical and electrical maintenance per year. Routine maintenance may include, but would not be limited to, replacing lubricating fluids, checking parts for wear and replacing, as required, and recording data from data-recording chips in all pertinent equipment including anemometers. O&M personnel would also inspect and maintain access roads, crane and turbine pads, erosion control systems, and perimeter fencing areas regularly and maintain them to ensure minimal degradation.

The proposed wind turbines would also be monitored continuously by the SCADA system of the project. Each turbine would be equipped with monitors that communicate major aspects of operation through communication lines. The SCADA system would send notification to the operations group if operational characteristics deviate outside set limits and, as described above, the turbines would be equipped with an



automatic braking system to shut down the turbine blades in such an event. O&M personnel would address all operational deviations and place the equipment back in service safely and in a timely manner.

The Kern County General Plan Safety Element further outlines protocol that would ensure that the project property is properly maintained. These measures include identifying access and evacuation routes at the project property, clearing dry vegetative cover, limiting potential fuel sources, and designing firebreaks (by at minimum adhering to the established setback distances). The project would implement all relevant safety measures into the operation and maintenance of the project in order to ensure the safety to the employees, visitors, and residents within the vicinity of the project property.



1.5 PROJECT OBJECTIVES

The following project objectives have been identified by the lead agencies and the applicant:

- Help the federal government reach its renewable energy goals;
- Support California's Renewable Portfolio Standard (RPS) and California Assembly Bill 32 by serving as a source of clean renewable energy, reducing the need for electricity generated from fossil fuels and offsetting greenhouse gas emissions;
- Deliver wind energy in the Tehachapi Wind Resource Area (TWRA) according to an executed Master Power Purchase and Wind Project Development Agreement (MDA) with SCE;
- Increase the tax base of Kern County;
- Provide increased revenue to BLM for the use of the federal land;
- Create a substantial number of temporary and permanent jobs in the county;
- Boost local business activity during construction and operation; and
- Provide revenue to county residents who own underutilized land that has little potential to be developed for other uses while allowing these landowners to retain much of their current land use.



1.6 PROPOSED DISCRETIONARY ACTIONS/REQUIRED APPROVALS

Construction and operation of the project may require certain discretionary actions and approvals including, but not limited to, those presented in Table 3, below.

Table 3. Proposed Discretionary Actions/Required Approvals

Agency	Permit/Authorization
FEDERAL	
Bureau of Land Management	• ROW Grant pursuant to the Federal Land Policy and Management Act • California Desert Conservation Area (CDCA) Plan Amendment
Tribal Historic Preservation Office/State Historic Preservation Office	• Programmatic Agreement or determination of No Adverse Effect under Section 106 consultation pursuant to the National Historic Preservation Act • Native American consultation
U.S. Fish and Wildlife Service	• Biological Opinion or determination of No Adverse Effect under Section 7 consultation pursuant to the Endangered Species Act • Programmatic Take Permit pursuant to the Bald and Golden Eagle Protection Act (if deemed required and if available)
Federal Aviation Administration	• Notice of Proposed Construction or Alteration Application • Determination of No Hazard
STATE	
California Department of Fish and Game	• Streambed Alteration Agreement pursuant to California Fish & Game Code Section 1602 • California Endangered Species Act Section 2081 Incidental take permit and/or Section 2080.1 Consistency Determination
Lahontan Regional Water Quality Control Board (Region 6)	• Waste Discharge Requirements • National Pollutant Discharge Elimination System (NPDES) General Permit for discharges associated with construction activity • Stormwater Pollution Prevention Plan
LOCAL	
Kern County	• Changes in Zone Classification (Discretionary) • Conditional Use Permit (Discretionary) • General Plan Amendment (Discretionary) • Public easement vacations (Discretionary; if deemed required) • Grading Permit (Ministerial) • Building, electrical, and well permits (Ministerial) • Franchise Agreement (Discretionary; if deemed required)
Kern County Air Pollution Control District	• Authority to Construct/Permit to Operate
Los Angeles Department of Water and Power	• Los Angeles Aqueduct Encroachment/Crossing Permit



ZCC 10, Map 168; ZCC 4, Map 168-27; ZCC 3, Map 179; ZCC 6, Map 180; ZCC 47, Map 197; CUP 7, Map 168

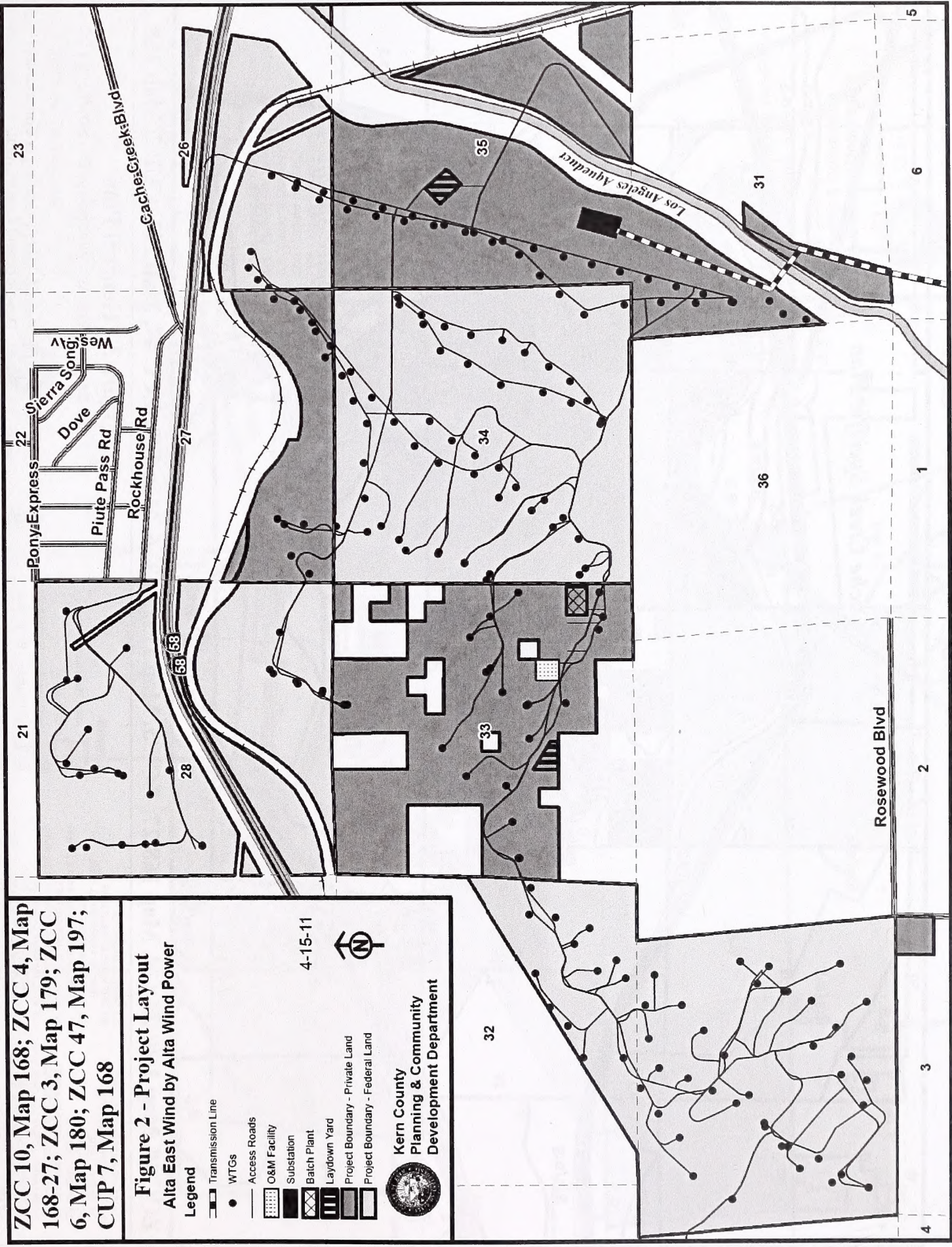
Figure 2 - Project Layout
Alta East Wind by Alta Wind Power

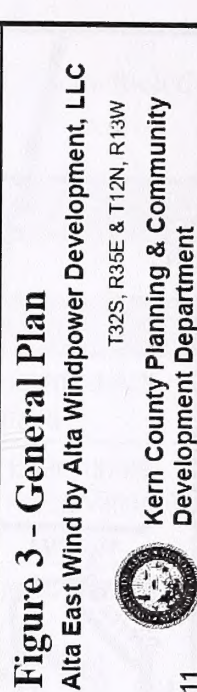
Legend

- Transmission Line
- WTGs
- Access Roads
- O&M Facility
- Substation
- Batch Plant
- Laydown Yard
- Project Boundary - Private Land
- Project Boundary - Federal Land

4-15-11

**Kern County
Planning & Community
Development Department**





by Alta Windpower Development, LLC
T32S, R35E & T12N, R13W
Kern County Planning & Community
Development Department

ZCC 10, Map 168; ZCC 4, Map 168-27; ZCC 3, Map 179; ZCC 6, Map 180; ZCC 47, Map 197; CUP 7, Map 168

General Plan Boundaries
specific_plans
Project Boundary - Federal
Project Boundary - Private
KernHwys

1.1 STATE AND FEDERAL LAND
2.1 SEISMIC HAZARD
2.4 STEEP SLOPE
3.2 FLOOD HAZARDS
3.3 OTHER FACILITIES
5.5 MAXIMUM 1 UNIT/NET ACRE
(43,560 SQ. FT. SITE AREA/UNIT)
5.6 MINIMUM 2.5 GROSS ACRES/UNIT
5.7 MINIMUM 5 GROSS ACRES/UNIT
5.8 MINIMUM 20 GROSS ACRES/UNIT
5.9 HIGHWAY COMMERCIAL
(MIN. 20- OR 80-ACRE PARCEL SIZE)



ZCC 10, Map 168; ZCC 4,
Map 168-27; ZCC 3, Map
179; ZCC 6, Map 180; ZCC
47, Map 197; CUP 7, Map 168

Figure 4 - Existing Zoning

KERN COUNTY ZONING

- A - Exclusive Agriculture
- A-1 - Limited Agriculture
- C2 - General Commercial
- E(x) - Estate (x acres)
- FPP - Floodplain Primary
- M-1 - Light Manufacturing
- M-2 - Medium Industrial
- M-3 - Heavy Industrial
- MP - Mobilehome Park
- OS - Open Space
- PL - Platted Lands
- FP - Floodplain Combining
- FPS - Floodplain Secondary Combining
- GH - Geologic Hazard Combining
- H - Airport Approach Height Combining
- PD - Precise Development Combining
- WE - Wind Energy Combining

Legend

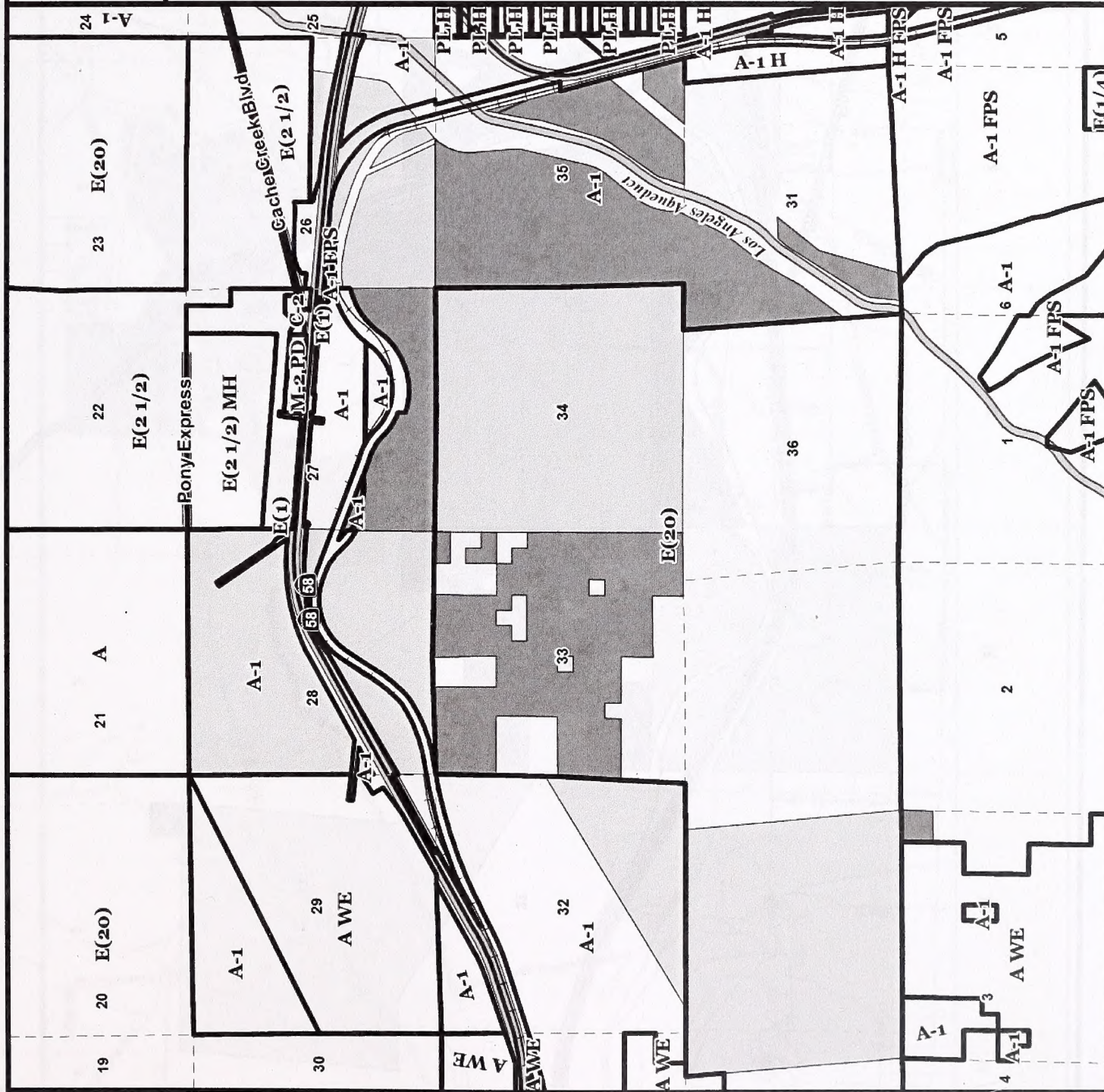
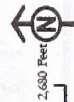
- Zoning Boundaries
- Project Boundary - Private Land
- Project Boundary - Federal Land
- Sections
- sections (polygon)
- railroad
- KernHwys
- arterials
- water bodies

Alta East Wind by Alta WindPower
T32S, R35E & T12N, R13W

Kern County
Planning & Community
Development Department



3-30-11





ZCC 10, Map 168; ZCC 4,
Map 168-27; ZCC 3, Map
179; ZCC 6, Map 180; ZCC
47, Map 197; CUP 7, Map 168

Figure 5 - Proposed Zoning

KERN COUNTY ZONING

- A - Exclusive Agriculture
- A-1 - Limited Agriculture
- C2 - General Commercial
- E(x) - Estate (x acres)
- FPP - Floodplain Primary
- M-1 - Light Manufacturing
- M-2 - Medium Industrial
- M-3 - Heavy Industrial
- MP - Mobilehome Park
- OS - Open Space
- PL - Platted Lands
- FP - Floodplain Combining
- FPS - Floodplain Secondary Combining
- GH - Geologic Hazard Combining
- H - Airport Approach Height Combining
- PD - Precise Development Combining
- WE - Wind Energy Combining

Legend

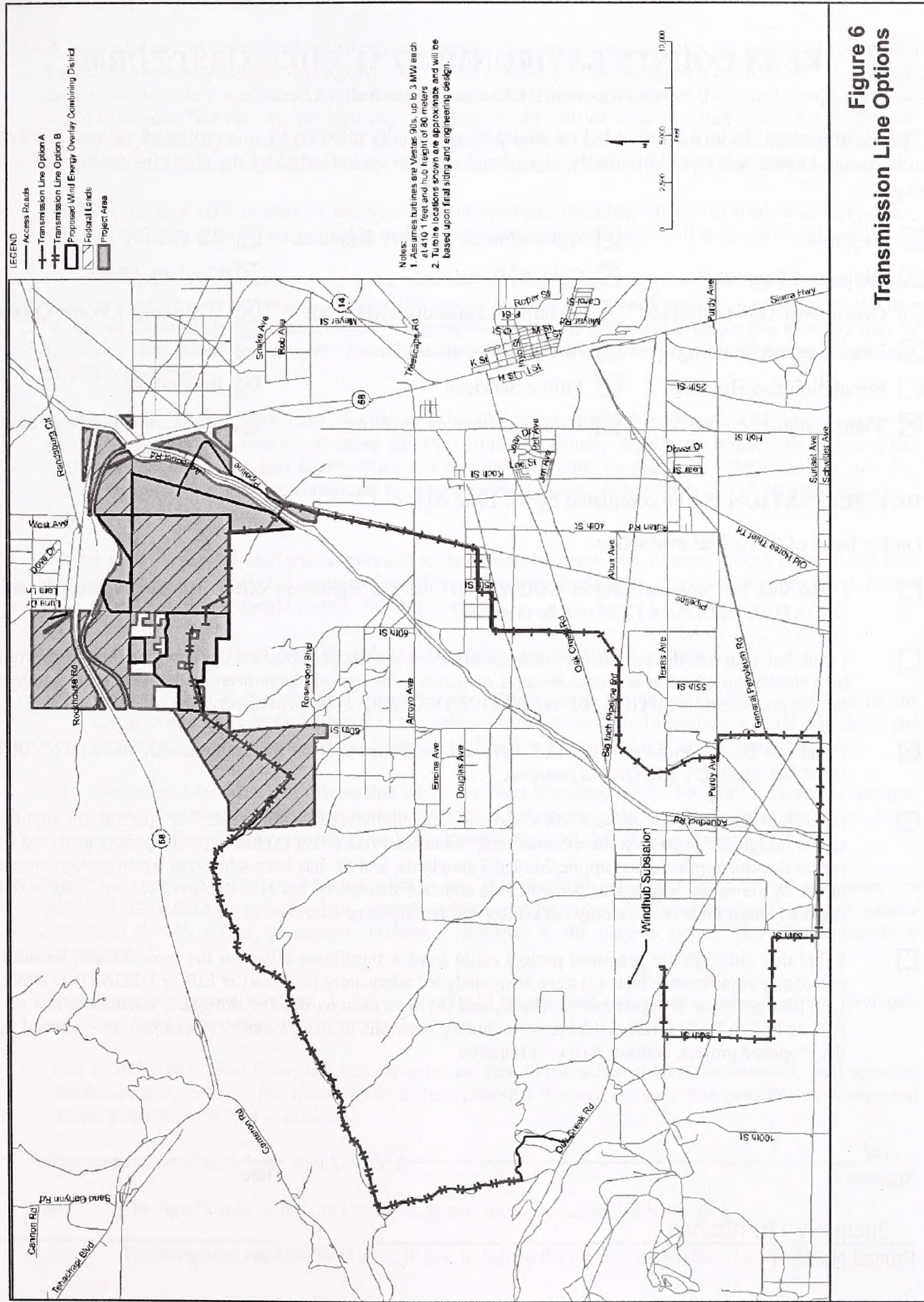
- A-1 to A WE
- E-20 to A WE
- A-1 to A
- E-20 to A
- A-1 to A FP
- Project Boundary - Private Land
- Project Boundary - Federal Land
- Sections

Alta East Wind by Alta WindPower
T32S, R35E & T12N, R13W

**Kern County
Planning & Community
Development Department**

3-23-11







KERN COUNTY ENVIRONMENTAL CHECKLIST FORM

Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this proposed Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | |
|--|--|--|
| ☒ Aesthetics | ☒ Agriculture & Forestry Resources | ☒ Air Quality |
| ☒ Biological Resources | ☒ Cultural Resources | ☒ Geology / Soils |
| ☒ Greenhouse Gas Emissions | ☒ Hazards & Hazardous Materials | ☒ Hydrology / Water Quality |
| ☒ Land Use and Planning | ☒ Mineral Resources | ☒ Noise |
| ☒ Population and Housing | ☒ Public Services | ☒ Recreation |
| ☒ Transportation & Traffic | ☒ Utilities / Service Systems | ☒ Mandatory Findings of Significance |

DETERMINATION (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENT IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

/s/ _____
Signature

Jacquelyn R. Kitchen
Printed Name

Date

For



Evaluation of Environmental Impacts:

- (1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- (2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- (3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- (4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measure and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, “Earlier Analyses,” may be cross-referenced).
- (5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or Negative Declaration, Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - (a) Earlier Analysis Used. Identify and state where they are available for review.
 - (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - (c) Mitigation Measures. For effects that are “Less Than Significant With Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- (6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- (7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- (8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- (9) The explanation of each issue should identify:
 - (a) The significance criteria or threshold, if any, used to evaluate each question.
 - (b) The mitigation measure identified, if any, to reduce the impact to less than significant.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact	Potentially Significant Impact	No Impact
AESTHETICS. <i>Would the project:</i>					
a. Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway?	☒	☐	☐	☐	☐
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐	☐

Discussion:

- (a) Development of the project and all facilities in the foothills of the Tehachapi Mountain Range would alter the views of the project area. Persons traveling in vehicles on nearby roads and hikers/equestrians passing near the project area along the Pacific Crest National Scenic Trail would observe substantial alterations to these existing views. The project would potentially result in significant alteration to existing scenic vistas. Therefore, this potential impact will be further evaluated in the EIR/EIS.
- (b) The project would not be visible from any Officially Designated (OD) State or County Scenic Highway, as none exist in Kern County. However, both SR-14 north of Mojave and SR-58 east of Mojave are designated as Eligible (E) for State Scenic Highway status (California Department of Transportation, 2011). The project would be visible from portions of SR-14 north of Mojave and SR-58 east of Mojave. As development of the project and all facilities would alter existing views of the project area, the project could substantially damage the viewsheds of these Eligible State Scenic Highways. Therefore, this potential impact will be further evaluated in the EIR/EIS.
- (c) Most of the project area supports native desert plant communities, predominately scrub brush, which are partially degraded by past and current grazing activities and by a network of paved and dirt roads. Lands managed by BLM along the projects western edge are mostly undeveloped. Existing land uses at and in the immediate vicinity of the project site include existing WTGs of varying heights and ages, overhead high-voltage transmission lines, grazing areas with rural fences, paved and unpaved roads, and undeveloped areas. Off-road vehicle (ORV) or off-highway vehicle (OHV) activities occur in the project vicinity and the Pacific Crest Trail passes within one mile of the northwestern portion of the project area. Development of the project and all facilities would represent a substantial visual change and increase the industrial character of the project site and its surroundings. Therefore the project's potential to substantially degrade the existing visual character or quality of the site and its surroundings will be further evaluated in the EIR/EIS.



- (d) The only existing source of light on the project site is from existing wind turbine generators to the north and rural residential development in the area. The WTGs would have a non-reflective finish and are not expected to be a source of glare. The project WTGs and meteorological towers will likely require nighttime lighting per FAA regulations, which could adversely affect nighttime views in and of the area. The type of lighting that the FAA would require has not yet been determined, but is anticipated to be red flashing lights. Additionally night lighting may be required for permanent structures (e.g., O&M building and substation) and would be consistent with the requirements of the Kern County Zoning Ordinance. Given the potential for the project to create a new source of nighttime lighting, this potentially significant impact will be evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
AGRICULTURE RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. <i>Would the project:</i>				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☒	☐
b. Conflict with existing zoning for agricultural use, or Williamson Act contract?	☒	☐	☐	☐
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland zoned Timberland Productions (as defined in Public Resources Code section 51104(g))?	☐	☐	☒	☐
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☒	☐
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☒	☐	☐	☐
f. Result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965 or Farmland Security Zone Contract for any parcel of 100 or more acres (Section 15206(b)(3) Public Resources Code)?	☐	☐	☒	☐

Discussion:

- (a) There is no designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the project area according to the California Division of Land Resource Protection Farmland Mapping and Monitoring Program Important Farmland maps. The project site has two land use designations according to the Department of Conservation: Grazing Land; and Non-agriculture and Natural Vegetation. Grazing Land is land on which the existing vegetation is suited for



grazing of livestock. Non-agriculture and Natural Vegetation includes heavily wooded, rocky or barren areas, riparian and wetland areas, small water bodies, and constructed wetlands, and grassland areas, which do not qualify for grazing. Although the project would remove some grazing land from agricultural use, the project would not result in the conversion of designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a nonagricultural use. Nevertheless, the EIR/EIS will discuss the potential conversion of Grazing Land and Nonagricultural and Natural Vegetation land to a nonagricultural use.

- (b) The Alta East Wind Project site is not located on lands that are under a Williamson Act contract. However, portions the project include the following agricultural land use designations:

- Project Site:
General Plan Designation – Extensive Agriculture;
Zoning Designation: A-1 (Limited Agriculture).
- Transmission Line Route:
General Plan Designations - 4.1 (Resource Agriculture), 8.3 (Extensive Agriculture);
Zoning Designation - A-1 (Limited Agriculture).

As construction and operation of the project would remove some land from agricultural use and change agricultural land use designations, potential impacts may occur and will be further analyzed in the EIR/EIS.

- (c)/(d) Both the project site and transmission line route options (including immediate surrounding properties) do not contain any land defined as forest land (as defined by Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or land zoned Timberland Production (as defined by Government Code section 51104(g)). No conversion of forestland to non-forest use or loss of forestland is expected to occur with the project. Nevertheless, the EIR/EIS will discuss this issue.
- (e) As discussed above in checklist question (b), construction and operation of the project would remove some land from agricultural use. Potential impacts from this change may occur and will be further analyzed in the EIR/EIS.
- (f) The Alta East Wind Project site is not located on lands that are under any land preservation contracts such as Williamson Act contracts. Therefore, the project would not result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965 or Farmland Security Zone Contract for any parcel of 100 or more acres (Section 15206(b)(3) Public Resources Code. No impacts would occur; nevertheless, the EIR/EIS will discuss this issue.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. <i>Would the project:</i>				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? Specifically, would implementation of the project exceed any of the following adopted thresholds:	☒	☐	☐	☐
i. San Joaquin Valley Unified Air Pollution Control District:				
Operational and Area Sources:				
Reactive Organic Gases (ROG) 10 tons per year.	☒	☐	☐	☐
Oxides of Nitrogen (NO _x) 10 tons per year.	☒	☐	☐	☐
Particulate Matter (PM ₁₀) 15 tons per year.	☒	☐	☐	☐
Stationary Sources determined by District Rules:				
Severe Nonattainment 25 tons per year.	☒	☐	☐	☐
Extreme Nonattainment 10 tons per year.	☒	☐	☐	☐
ii. Kern County Air Pollution Control District:				
Operational and Area Sources:				
Reactive Organic Gases (ROG) 25 tons per year.	☒	☐	☐	☐
Oxides of nitrogen (NO _x) 25 tons per year.	☒	☐	☐	☐
Particulate Matter (PM ₁₀) 15 tons per year.	☒	☐	☐	☐



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
Stationary Sources – determined by District Rules:				
25 tons per year.	☒	☐	☐	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Discussion:

- (a)/(b) The project would be located entirely within the jurisdiction of the Eastern Kern Air Pollution Control District (APCD) in the Mojave Desert Air Basin (MDAB). The MDAB is designated non-attainment for both the State and federal ozone standards, and the State particulate matter of less than 10 microns in size (PM10) standard. Equipment usage and activities during construction of the project would result in emissions of PM10 and ozone precursors, including nitrogen oxides (NOx) and volatile organic compounds (VOC), which could result in significant impacts to air quality in the area. The sources of emissions include heavy equipment used to excavate and grade the turbine pads and roads, cranes, and on-road motor vehicles for equipment and material deliveries and workers commuting to the site. Activity on unpaved roads and lay-down areas and grading would contribute to PM10 emissions. This impact is potentially significant. Further analysis of air quality impacts is warranted to determine whether the project would conflict with or obstruct implementation of the applicable plans for attainment and if so, to determine the reasonable and feasible mitigation measures that could be imposed. Short-term construction emissions and temporary facilities could significantly contribute to an existing or projected air quality violation of PM10 or ozone standards, requiring the consideration of mitigation measures. These issues will be evaluated in the EIR/EIS.
- (c) The Eastern Kern APCD is a nonattainment area for the State and federal ozone standards, and the State PM10 standard, and the Eastern Kern APCD rules and regulations apply to all project activities. No project activities would occur within the San Joaquin Valley Unified Air Pollution Control District. Cumulative contributions to the MDAB could be potentially significant. Cumulative contribution of construction and operational emissions will be analyzed in the EIR/EIS.
- (d) Land uses determined to be “sensitive” to air quality include residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches. The nearest sensitive receptors to the project are residences and recreational areas within and adjacent to the project boundaries. Construction-related activity and temporary facilities would result in diesel exhaust emissions and dust that could adversely affect air quality for the nearest sensitive receptors. Mitigation measures for diesel equipment and dust control that are recommended by the Eastern Kern APCD will be evaluated as part of the EIR/EIS to avoid or reduce the impacts to construction workers and affected sensitive receptors.
- (e) Aside from odors associated with vehicle exhaust and fueling, no other odors would result from the project. Due to the limited reach of these odor sources and the distance of potential receptors in the vicinity of these activities, fueling odors during project construction would not impact a substantial number of people. Therefore, the project is not expected to result in significant impacts to air quality related to objectionable odors; nevertheless, the EIR/EIS will discuss this issue.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
--	--------------------------------------	---	------------------------------------	--------------

BIOLOGICAL RESOURCES. *Would the project:*

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐

Discussion:

- (a) Field surveys have identified several special-status, including federally and State-listed, species within and adjacent to the project area. Construction and operation of the project has the potential to result in significant direct and indirect impacts to these species and their habitat. Therefore, this potential impact will be further evaluated in the EIR/EIS.
- (b)-(c) The project area supports numerous desert washes that are likely under the jurisdiction of California Department of Fish and Game (CDFG) as waters of the State and potentially also under the jurisdiction of U.S. Army Corps of Engineers. Other sensitive natural communities identified in



local or regional plans, policies, and regulations or by the CDFG or United States Fish and Wildlife Service (USFWS) may also be present within the project area. These potentially significant impacts to jurisdictional wetlands and other water, as well as sensitive natural communities, will be evaluated in the EIR/EIS.

- (d) The project area and vicinity may be used for migration or dispersal by wildlife, including bats, migratory birds, desert tortoise and other reptiles, as well as mammals. Further, the project area may, although is not currently known to, contain movement corridors essential for population connectivity. Birds and bats may be subject to mortality during wind turbine operation if they collide with the towers or turbine blades. Construction of the project would potentially impede migration and/or habitat connectivity. This impact is potentially significant and will be evaluated in the EIR/EIS.
- (e) Ordinances from the Kern County General Plan pertaining to protection of biological resources may apply to the project area. Consistency with this and other local policies or ordinances will be evaluated in the EIR/EIS.
- (f) Portions of the project are located within the California Desert Conservation Area Plan and its amendment, the West Mojave Plan. Consistency with these and any other or approved local, regional, or State habitat conservation plans will be evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
CULTURAL RESOURCES. <i>Would the project:</i>				
a. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5?	☒	☐	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?	☒	☐	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

Discussion:

- (a) Cultural resources surveys will be completed for the site and the transmission route options. The results of these surveys will be included within the EIR/EIS. Further evaluation is warranted to identify potential impacts and formulate avoidance or mitigation measures, if applicable.
- (b) Archaeological surveys will be completed for the site and the transmission route options. The results of these surveys will be included within the EIR/EIS. Further evaluation is warranted to identify potential impacts and formulate avoidance or mitigation measures, if applicable.
- (c) A paleontological records search and survey will be completed for the project site and transmission line route options. The results of the records search and survey will be included within the EIR/EIS. The Horned Toad Formation, a geological formation with a high sensitivity for paleontological resources, is located within the project site. Potential impacts to paleontological resources and mitigation measures will therefore, be evaluated in the EIR/EIS.
- (d) If human burial grounds are identified in any part of the project area, the project would be redesigned to avoid them. Given the sensitivity of the project area, the potential for locating human remains is reasonably foreseeable, and therefore, potentially significant. The EIR/EIS will evaluate this potential impact and identify measures to be implemented if any are unexpectedly uncovered during the course of development.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
GEOLOGY AND SOILS. <i>Would the project:</i>				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☒	☐	☐	☐
b. Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☒	☐	☐	☐

Discussion:

- (a) (i) The entire County is located in a seismic Zone 4, a designation previously used in the Uniform Building Code (UBC) (the predecessor to the International Building Code) to denote the areas of highest risk to earthquake ground motion. An Alquist-Priolo Special Study Zone does not cross the project site or the transmission line route options. However, the project area is located near major earthquake faults, and, therefore, may have the potential to expose people or structures to adverse effects. Significant seismic activity in the area could adversely affect structures and workers on the site. This issue will be evaluated in the EIR/EIS.
- (ii) As discussed above in checklist question (a)(i), the project is located in a seismically active area. Strong seismic ground shaking could occur at the project site, resulting in damage to



structures that are not properly designed to withstand strong ground shaking. The project would potentially be subject to moderate to strong ground shaking from local and regional earthquakes. This potential impact will be evaluated in the EIR/EIS.

- (iii) The project area has not been identified by the Safety Element of the Kern County General Plan (2007) as an area that is subject to liquefaction hazards. However, due to the potential for major seismic activity in the project area, the potential for substantial adverse effects due to seismic-related ground failure, including liquefaction, will be examined in the EIR/EIS.
- (iv) Although the project site is not considered to be at high-risk area for landslides, the potential for substantial adverse effects due to landslides will nevertheless be analyzed in the EIR/EIS.
- (b) Grading and excavation would be required for foundations for each WTG tower. Grading would also be required for construction of access roads throughout the project site. Construction activities could result in substantial soil erosion if the improved access roads and/or turbine sites are not properly designed. These issues and the potential for increased erosion will be evaluated in the EIR/EIS.
- (c) The geotechnical report will examine the current baseline stability of the soils that underlie the project area and the findings of that report will be presented and evaluated in the EIR/EIS. The project would be designed such that it would not degrade the stability of the underlying soils. Because of this, potential impacts are expected to be less than significant. However, the findings of the geotechnical report and these issues will be evaluated in the EIR/EIS and mitigation measures will be presented, if necessary, to protect both structures and people from adverse effects due to landslide, lateral spreading, subsidence, liquefaction, or collapse.
- (d) The soil present at the site and along the transmission line route options are primarily sands, gravels and rock that typically would not exhibit shrink and swell characteristics. Expansive soils generally result from specific clay minerals that expand when saturated and shrink in volume when dry. Although clays and other fine grained soils are not expected to be common at the project site, the EIR/EIS will confirm and evaluate the presence or absence of expansive soils.
- (e) The project would include construction of a limited septic system or leach lines to accommodate on-site operations facilities if required by the Kern County Environmental Health Services Division; therefore, the ability of soils within the project area to support a septic tank will be examined in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact Unless Mitigated
	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact Unless Mitigated

GREENHOUSE GAS EMISSIONS. *Would the project:*

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

Discussion:

(a)/(b) Global climate change is an international phenomenon, and the regulatory background and scientific data are changing rapidly. In 2006, the California state legislature adopted AB 32, the California Global Warming Solutions Act of 2006. Assembly Bill (AB) 32 describes how global climate change would affect the environment in California. The impacts described in AB 32 include changing sea levels, changes in snow pack and availability of potable water, changes in storm flows and flood inundation zones, and other impacts.

As required by AB 32, California Air Resources Board (CARB) determined what the statewide greenhouse gas (GHG) emissions level was in 1990 and then approved a statewide GHG emissions limit that is equivalent to that level, which is to be achieved by 2020. CARB approved the 2020 limit on December 6, 2007. CARB's GHG inventory estimated the 1990 emissions level in California to be 427 million metric tons carbon dioxide equivalent (MMTCO₂e). In 2004, the emissions were estimated to be 480 MMTCO₂e.

The primary source of GHG emissions from the project during operation would be mobile sources. Not all GHGs exhibit the same ability to induce climate change; therefore, GHG contributions are commonly quantified in carbon dioxide equivalencies. The carbon dioxide equivalent (CO₂e) portion of GHGs from the project will be estimated in an air quality impact analysis using the URBEMIS program and California Climate Action Registry (CCAR) General Reporting Protocol. These emissions would be predominantly produced during construction and therefore would be short term in duration and would not have a continual impact on the environment. The project's operational emissions are expected to be low. Regardless, since this project would replace the creation of energy through other methods, such use of a natural gas-fired turbine, the operational GHG emissions may have a reduction in GHG emissions. Impacts related to GHGs and climate stemming from the project and any potential conflicts with any applicable plan or policy will be evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS. <i>Would the project:</i>				
a. Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	☒	☐	☐	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e. For a project located within the adopted Kern County Airport Land Use Compatibility Plan, would the project result in a safety hazard for people residing or working in the project area?	☒	☐	☐	☐
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☒	☐	☐	☐



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
i. Would implementation of the project generate vectors (flies, mosquitoes, rodents, etc.) or have a component that includes agricultural waste? Specifically, would the project exceed the following qualitative threshold:				
i. Occur as immature stages and adults in numbers considerably in excess of those found in the surrounding environment; and	☐	☐	☒	☐
ii. Are associated with design, layout, and management of project operations; and	☐	☐	☒	☐
ii. Disseminate widely from the property; and	☐	☐	☒	☐
iv. Cause detrimental effects on the public health or well being of the majority of the surrounding population.	☐	☐	☒	☐

Discussion:

- (a) The project is not expected to result in impacts from hazards and hazardous materials with respect to creating a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials because the project would not involve the routine transport, use, or disposal of hazardous materials as defined by the Hazardous Materials Transportation Uniform Safety Act. The only hazardous materials expected to be transported to and from the site include transformer oil (which is used in electrical transformers), vehicle fuel, carburetor fluid, and various types and grades of lubrication oil, all of which are expected to be used in small quantities for project construction and daily maintenance during operations. However, the EIR/EIS will evaluate the transport and use of these materials. The closest route that is designated for the transport of hazardous materials is State Route (SR) 58, located immediately adjacent to the project site. The project does not anticipate the need for blasting to prepare WTG foundations. However, in the unlikely event that blasting is required it will be evaluated in the EIR/EIS.
- (b) Potential impacts that may result from construction and operation of the project include the accidental release of storage materials such as transformer oil, which is used in electrical transformers for turbines, vehicle fuel, carburetor fluid, and various types and grades of lubricants, solvents, and oils. The toxicity and potential release of these materials will depend on the quantity, the type of storage container, safety protocols used on the site, the location and/or proximity to receptors, the frequency and duration of spills or storage leaks, and the reactivity of hazardous substances with other materials. The use of all materials used on site, how the materials will be transported, in what form they will be used, possible environmental contamination or worker exposure, and identification of all regulations and standard protocols to be followed during the storage, transportation, and usage of any hazardous materials will be evaluated in the EIR/EIS.
- (c) There are no schools located within one mile of the project site or transmission line route options. The nearest school is the Douglas Adult School and the Mountain View Continuation School, which are located two miles to the south. The use of materials such as transformer oil, which is



used in electrical transformers for turbines, vehicle fuel, carburetor fluid, and various types and grades of lubricants, solvents, and oils do not have the potential to extend beyond the work areas on-site. Project-related infrastructure would not emit hazardous materials or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or school. Nevertheless, potential impacts will be discussed in the EIR/EIS.

- (d) The project is not located on the lists of parcels relating to hazardous wastes pursuant to Section 65962.5 of the California Government Code. Nevertheless, potential impacts will be discussed in the EIR/EIS.
- (e) The project area is located approximately 2.5 miles from the Mojave Air and Space Port, 10 miles from the California City Municipal Airport, 12.5 miles from the Mountain Valley Airport and 13 miles from the Tehachapi Municipal Airport. Safety hazards for people residing or working in the project area with respect to the project's proximity to a public or military use airport are expected to be less than significant due to the distances from such facilities. However, the EIR/EIS will evaluate potential impacts related to aviation safety hazards and compliance with the Kern County Airport Land Use Compatibility Plan (ALUCP), Federal Aviation Administration (FAA) 7460, and military airspace requirements.
- (f) The project site is not located within 2 miles of a private airstrip. No safety hazard for people residing or working in the project area with respect to the project's proximity to a private airstrip is expected to occur due to the distances from such facilities. Nevertheless, potential impacts will be discussed in the EIR/EIS.
- (g) Operation of the project is not anticipated to physically impede the existing emergency response plans, emergency vehicle access, or personnel access to the site. Therefore, no operational impacts related to impairment of the implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan is anticipated. However, construction of the project would generate construction trips and potential roadway lane closures that could temporarily increase the daily traffic volumes on local roadways and intersections, thereby impeding emergency access. Therefore, the potential for project construction-related traffic to impair or interfere with emergency response or evacuation plans will be evaluated in the EIR/EIS.
- (h) The project site is under the jurisdiction of the Kern County Wildland Fire Management Plan. This plan documents the wildland fire situation within the county. The project site is within a State Responsibility Area (SRA), and the California Department of Forestry and Fire Protection (CAL FIRE) implements wildfire planning and protection for the SRA. The project site and transmission line route options would be located in an area highly susceptible to wildfires. Vegetation consists of juniper woodland, mixed chaparral, Joshua tree woodland, and bitterbrush, with areas of introduced annual grasses, and native needle grass grassland, and areas of single-leaf pinyon pine woodland. The potential for construction and operation of the project to result in increased risk of wildfires in the project area will be evaluated in the EIR/EIS. The evaluation will include a review of the 2004 Kern County Fire Department Wildland Fire Management Plan and CAL FIRE's and Kern County Fire Department's prevention measures for wildland fires.
- (i)(i-iv) The project would result in construction of WTGs, substations, transmission line infrastructure, and O&M facilities. Project-related infrastructure is not expected to result in features or conditions (such as standing water, agricultural products, agricultural waste, or human waste) that would provide habitat for vectors such as mosquitoes, flies, cockroaches or rodents. Workers would generate small quantities of solid waste (i.e., trash) that would be appropriately stored for permanent disposal. Nevertheless, potential impacts will be discussed in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
HYDROLOGY AND WATER QUALITY. <i>Would the project:</i>				
a. Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☒	☐	☐	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on-site or off-site?	☒	☐	☐	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?	☒	☐	☐	☐
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f. Otherwise substantially degrade water quality?	☒	☐	☐	☐
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☒	☐	☐	☐
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☒	☐	☐	☐
j. Inundation by seiche, tsunami, or mudflow?	☒	☐	☐	☐



Discussion:

- (a) Construction of the project would be subject to County, State, and federal water quality regulations. This includes, but is not limited to, required adherence to the federal Clean Water Act, National Pollutant Discharge Elimination System requirements, the National Flood Insurance Act, requirements of the California Department of Water Resources, adherence to the requirements of the California Fish and Game Code, the California Water Code, the requirements of the Kern County General Plan and Zoning Ordinance, etc. Development of the project would result in a significant impact to hydrology and water quality if associated construction, maintenance, or decommissioning activities would result in the violation of any water quality or waste discharge standards. Such violations could occur through the creation of erosion, sedimentation, and/or polluted runoff, through the accidental release of potentially hazardous materials required during construction or operational activities, or through the discharge of contaminated groundwater during dewatering activities. It is anticipated that appropriate best management practices and compliance with applicable regulations would reduce potential water quality impacts to a less than significant level; however, this potential impact will be evaluated fully in the EIR/EIS.
- (b) The project may include the construction of a new water well in order to supply water to the project during construction. If the project applicant is unable to secure the use of water via a new well within the project boundary, then water would be imported via truck to the site for use in the temporary concrete batch plant as well as for dust abatement activities. The project is located in the jurisdiction of the Regional Water Quality Control Board, Lahontan Region 4. Because the project would not include a substantial increase in impervious surfaces, the project is not anticipated to interfere substantially with groundwater recharge. However, a Water Supply Assessment is being prepared to analyze groundwater supplies and recharge in the project area, and the EIR/EIS will analyze potential hydrology and water quality impacts associated with this issue.
- (c) Grading would be required for access roads throughout the project site. Leveling and excavation would be required for each WTG installation site. The turbines would require the construction of concrete pads and fencing and would be strategically placed on the topography in turbine rows. Transmission line poles would also require grading. The construction of these project features could potentially alter the existing drainage pattern of the site or area. Evaluation of impacts to drainage patterns resulting from project components, as well as the potential for increased erosion and/or siltation will be evaluated in the EIR/EIS.
- (d) An increase in impervious surfaces could increase stormwater run-off. As discussed above in checklist question (c), project features could potentially alter the existing drainage pattern of the site or area and would generate new impervious surfaces. Evaluation of impacts related to the project potential alteration of drainage patterns of the site will be evaluated in the EIR/EIS.
- (e) The project would increase impervious surfaces on-site, which could substantially increase stormwater runoff. The applicant would be required to prepare a drainage plan to address potential stormwater run-off impacts. Further analysis is required to identify appropriate mitigation/design measures and evaluate their effectiveness. Evaluation of the project's potential to impact capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff will be evaluated in the EIR/EIS.
- (f) Project construction activities (such as grading of access roads) could potentially degrade water quality through erosion and subsequent sedimentation of streams. Additionally, accidental release of potentially harmful materials, such as engine oil, diesel fuel, turbine lubricant, and cement slurry, could degrade water quality of nearby streams. This potential impact will be further evaluated in the EIR/EIS.



- (g) The project does not include housing. Therefore, no impact would occur; however, this issue will be discussed in the EIR/EIS.
- (h) Portions of the project site are located within an A Zone (100-year) Flood Hazard Area as delineated on the Federal Emergency Management Agency's (FEMA) Digital Flood Insurance Rate Maps (DFIRM). The project requests the overlay of the Floodplain (FP) Combining District over portions of the project located within the A Zone. The purpose of the FP Combining District is to protect public health and safety and minimize property damage by designating areas that are potentially subject to flooding by establishing reasonable restrictions on land use. While the project does not include the placement of structures within a 100-year flood hazard zone, the potential for project structures to redirect or impede flood flows within a floodplain zone will be evaluated in the EIR/EIS.
- (i) The project would not be not located within an area that is subject to flooding due to failure of a levee or dam. However, portions of the project site are located within an A Zone (100-year) Flood Hazard Area as delineated on the Federal Emergency Management Agency's (FEMA) Digital Flood Insurance Rate Maps (DFIRM). Therefore, the potential for project structures to be impacted by flood flows within this floodplain zone will be evaluated in the EIR/EIS.
- (j) The project is not located near an ocean or enclosed body of water, and would not be subject to inundation by seiche or tsunami. Mudflows are a type of mass wasting or landslide, where earth and surface materials are rapidly transported downhill under the force of gravity. Mudflow events are caused by a combination of factors, including soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall that the soil is not able to sufficiently drain or absorb. As a result of this super-saturation, soil and rock materials become unstable and eventually slide away from their existing location. The potential for project structures to be inundated by mudflow will be further evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
LAND USE AND PLANNING. <i>Would the project:</i>				
a. Physically divide an established community?	☒	☐	☐	☐
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☒	☐	☐	☐

Discussion:

- (a) The project is not within or adjacent to any established community. However, as the project would involve a change in zoning designations and new project features, this potential impact will be evaluated in the EIR/EIS.
- (b) The project area is within the boundaries of the Kern County General Plan (KCGP) and the Mojave Specific Plan (MSP). The KCGP and MSP designate the site as: Map Code 1.1 (State or Federal Land), Map Code 8.3 (Extensive Agriculture), Map Code 8.4 (Mineral and Petroleum), and Map Code 8.5 (Resource Management). The site is also designated with the following combining hazard overlays: Map Code 2.4 (Steep Slope) and Map Code 2.5 (Flood Hazard). The Kern County Zone Districts in the project area are: A-1 (Limited Agriculture), and E (20) (Estate, 20 acres).

Under the project, a portion of the project area would be changed from the existing zone classifications to the A WE (Exclusive Agriculture, Wind Energy Combining) District. The WE Combining District contains specific development standards and conditions that apply to all construction and siting of wind turbines in this zone. Consistency of the project with the policies of the Kern County General Plan and any other applicable land use plan, policy, or regulation will be evaluated in the EIR/EIS.

- (c) The project is not within the boundaries of any adopted habitat conservation plan or natural community conservation plan. However, the project is encompassed in the area covered by the California Desert Conservation Area Plan and its amendment, the West Mojave Plan. Consistency with these and any other or approved local, regional, or State habitat conservation plans will be evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact	Potentially Significant Impact	No Impact
MINERAL RESOURCES. <i>Would the project:</i>					
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☒	☐	☐	☐	☐
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☒	☐	☐	☐	☐

Discussion:

- (a)(b) Kern County is known to contain numerous mining operations that extract a variety of materials, including sand and gravel, stone, gold, dimensional stone, limestone, clay, shale, gypsum, pumice, decorative rock, silica, and specialty sand. It is anticipated that mineral resources occur within the project area given its designation under the Kern County General Plan as Mineral and Petroleum, which applies to areas that contain producing or potentially producing petroleum fields, natural gas, or geothermal resources, or mineral deposits of statewide significance. The project may potentially preclude access for extraction of valuable or locally-important mineral resources if present within the project area. Therefore, these potential impacts will be further evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
NOISE. <i>Would the project result in:</i>				
a. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?	☒	☐	☐	☐
b. Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels?	☒	☐	☐	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
e. For a project located within the Kern County Airport Land Use Compatibility Plan, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Discussion:

- (a) Land uses determined to be “sensitive” to noise as defined by the Kern County General Plan include residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches. The nearest sensitive receptors to the project are residences and recreational areas within and adjacent to the project boundaries. Implementation of the project would result in a change in the zone classification on various properties on the project site to include the WE Combining District. This classification requires that noise levels associated with wind turbine operations do not exceed 45 dBA (A-weighted decibels) for more than five minutes out of any one hour time period or 50 dBA for any period of time if the turbine is within 50 feet of any existing residence, school, hospital, church, or public library (Kern County Ordinance 19.64.140 (J)). A noise analysis will be included in the EIR/EIS to determine the project’s consistency with the applicable noise regulations and provisions of the Kern County General Plan and Zoning Ordinance.
- (b) Ground-borne vibration and ground-borne noise could originate from earth movement during the construction phase of the project as well as from operation and maintenance of the facilities. The project would be expected to comply with all applicable noise regulations and requirements for long-term operation, as well as with measures to reduce excessive ground-borne vibration and noise to ensure that the project would not expose persons or structures to excessive ground-borne vibration. However, due to potential vibration impacts during construction, further analysis of ground-borne vibration and ground-borne noise will be included in the EIR/EIS.



- (c) Turbine operation, maintenance related traffic, and general maintenance activities associated with the project would introduce permanent noise sources to the project area. Construction activity would also increase ambient noise levels for a temporary period of time during construction. Further analysis of ambient noise levels and the project's potential impact on those levels will be included in the EIR/EIS.
- (d) Heavy equipment use during construction would cause a temporary or periodic increase in ambient noise levels. Project construction activity would increase ambient noise levels in the immediate area above existing levels for 9 to 12 months. Temporary or periodic increases in ambient noise levels caused by construction activities could be reduced with the incorporation of mitigation measures. Project-related construction noise levels will be quantified and evaluated in the EIR/EIS.
- (e) The project area is located approximately 2.5 miles from the Mojave Air and Space Port, 10 miles from the California City Municipal Airport, 12.5 miles from the Mountain Valley Airport and 13 miles from the Tehachapi Municipal Airport. Aviation related noise hazards for people residing or working in the project area are expected to be less than significant with respect to the project's proximity to a public or military use airport. However, because this project is located within the sphere of influence of an airport identified in the Kern County Airport Land Use Compatibility Plan, the EIR/EIS will discuss this issue.
- (f) The project is not located within 5 miles of a private airstrip; therefore, implementation of the project is not expected to expose individuals working in the project area to excessive noise levels generated from private airstrips. Nevertheless, the EIR/EIS will discuss this issue.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
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POPULATION AND HOUSING. *Would the project:*

a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☒	☐	☐	☐
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☒	☐	☐	☐

Discussion:

- (a) Typical established local thresholds of significance for housing and population growth pursuant to the State CEQA Guidelines, Section 15064.7 include effects that would induce substantial growth or concentration of a population beyond County projections, alter the location, distribution, density, or growth rate of the population beyond that projected in the Housing Element, result in a substantial increase in demand for additional housing, or create a development that significantly reduces the ability of the County to meet housing objectives set forth in the General Plan Housing Element.

Construction of the project is expected to require an average of 80 workers with a peak of 262 workers over a three week period during construction, which would be a minimal increase in employment over the 9-12 month construction period given the project area's existing population. Construction workers are expected to travel to the site from various locations throughout southern California, and the number of workers expected to relocate to the surrounding area is not expected to be substantial. Operation of the project would also require up to 15 full-time or part-time staff. The EIR/EIS will contain analysis to determine the project's potential for directly or indirectly inducing any new population or the development of housing or businesses.

Although the project would produce additional electricity, it is intended to meet the demand for energy that is already projected based on growth in communities around California. While the project's electricity would replace electricity generated by fossil fuels, thereby contributing to California's renewable energy goals, the production of additional electricity may indirectly be growth inducing. These issues will be analyzed within the EIR/EIS.

- (b)/(c) Although not anticipated, the EIR/EIS will identify and analyze any impacts to identified residential or commercial buildings requiring relocation. Should any occupied buildings need to be relocated, the EIR/EIS will contain appropriate mitigation. Additionally, the project's potential for displacement of any persons will be evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
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PUBLIC SERVICES.

- a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services:

i) Fire protection?	☒	☐	☐	☐
ii) Police protection?	☒	☐	☐	☐
iii) Schools?	☒	☐	☐	☐
iv) Parks?	☒	☐	☐	☐
v) Other public facilities?	☒	☐	☐	☐

Discussion:

- (a) The Kern County Fire Department provides fire suppression and emergency medical services to the project area. The Mojave Station, located 3.5 miles southeast of the project site at 1953 SR-58 in Mojave, would be the primary fire station to service the project. The majority of the project site is within a State Responsibility Area (SRA), and CAL FIRE implements wildfire planning and protection for the SRA. Construction and operation activities may result in increased risk of wildfire, which could impact firefighting capacity in the area. The potential impact on fire services from construction in a SRA area and operation of the project is therefore potentially significant and will be evaluated in the EIR/EIS.

The Kern County Sheriff's Department provides police protection services to the project area. The Mojave Substation, located 3.5 miles southeast of the project site at 1771 SR-58 in Mojave, would be the primary police substation to service the project area. During construction, on-site security would be provided. In addition, temporary construction fencing with gated site access would be installed in accordance with County regulations to assure security and personnel safety during construction. Where appropriate, construction fencing may be retained for permanent fencing and would be constructed to meet standards for permanent installations. While security and fencing would minimize the need for police surveillance and response, the project's impacts on sheriff services and existing capacities is potentially significant and will be evaluated in the EIR/EIS.

Construction of the project is expected to require an average of 80 workers with a peak of 262 workers over a three week period during construction, which would be a minimal increase in employment over the 9-12 month construction period given the project area's existing population. Construction workers are expected to travel to the site from various locations throughout southern California, and the number of workers expected to relocate to the surrounding area is not expected



to be substantial. Operation of the project would also require up to 15 full-time or part-time staff. However, further analysis is required to determine the project's potential for directly or indirectly inducing new population growth. The EIR/EIS will analyze any population increase that would be experienced during construction and operation of the project that could result in additional demand for school facilities.

As further analysis is required to determine the project's potential for directly or indirectly inducing population growth, the EIR/EIS will analyze any population increase that would be experienced during the construction phase and operation of the project that could result in additional demand for recreational facilities. The project is expected to result in less than significant impacts on public services, such as post office and library services. Nevertheless, all impacts on public services will be evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact	No Impact
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RECREATION.

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

Discussion:

- (a) Construction of the project is expected to require an average of 80 workers with a peak of 262 workers over a three week period during construction, which would be a minimal increase in employment over the 9-12 month construction period given the project area's existing population. Construction workers are expected to travel to the site from various locations throughout southern California, and the number of workers expected to relocate to the surrounding area is not expected to be substantial. Operation of the project would also require up to 15 full-time or part-time staff. The temporary increase of population during construction that might be caused by an influx of workers would not likely result in an increase in the use of County parks, private golf courses, the Pacific Crest Trail (PCT), or other recreation facilities that would deteriorate the subject recreational facilities. However, further analysis is required to determine the project's potential for directly or indirectly inducing new population. The EIR/EIS will analyze any population increase that would be experienced during construction and operation of the project that could result in additional demand for recreational facilities.
- (b) The project does not include new recreational facilities or require construction or expansion of recreational facilities. However, a portion of the PCT passes within one mile of the northwestern portion of the project area. The PCT is an international hiking trail that extends from Mexico to Canada through California, Oregon and Washington. Impacts to this trail and other recreational facilities as well as wilderness areas, including potential preclusion of access and degradation of value, will be further evaluated in the EIR/EIS.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
TRANSPORTATION/TRAFFIC. <i>Would the project:</i>				
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☒	☐	☐	☐
b. Exceed, either individually or cumulatively, a Level of Service standard established by the county congestion management agency or adopted County threshold for designated roads or highways? Specifically, would implementation of the project cause the Level of Service (LOS) for roadways and/or intersections to decline below the following thresholds or further degrade already degraded segment(s):				
i. Metropolitan Bakersfield General Plan LOS "C"	☒	☐	☐	☐
ii. Kern County General Plan LOS "D"	☒	☐	☐	☐
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☒	☐	☐	☐
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
e. Result in inadequate emergency access?	☒	☐	☐	☐
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☒	☐	☐	☐



Discussion:

- (a) Both SR-14 and SR-58 provide regional access to the project area. Project-related traffic would use access roads entering the project from the west or the east. Construction of the project will take approximately 9 to 12 months. Vehicle trips generated by construction workers traveling to the site as well as equipment and materials deliveries would add vehicle trips to the area roadway system. Delivery of construction materials would require a number of oversize vehicle trips that may travel at slower speeds than existing traffic and, due to their size, may intrude into adjacent travel lanes. These oversize trips may decrease the existing level of service (LOS) on area freeways, roadways and intersections. Additionally, the total number of vehicle trips associated with all construction-related traffic (including construction workers) could temporarily increase daily traffic volumes traveling on local roadways and intersections. Furthermore, stringing activities required for transmission line infrastructure may require temporary lane closures that may result in temporary traffic delays on affected roadways. The EIR/EIS will evaluate these potential impacts on the local roadway system from construction related vehicle trips.

Once constructed, the project is expected to employ a relatively small number of staff and generate minimal daily trips to maintain the project. However, the potential impact of project operational traffic on the area roadway system will be evaluated in the EIR/EIS.

- (b) (i) The project site is located approximately 40 miles southeast of the metropolitan Bakersfield area. Construction and operation of the project would result in increased vehicle trips on roadways in the project area; however, these trips are not expected to be focused within or result in a substantial number of trips on roadways in the metropolitan Bakersfield area. However, potential impacts to Bakersfield metropolitan area roadways will be discussed in the EIR/EIS.
- (ii) Construction of the project would generate construction trips and may require roadway lane closures, which could temporarily increase the daily traffic volumes or delays on local roadways and intersections. Operation of the project would also generate trips on local roadways. The potential impacts of these conditions on LOS of area roadways will be evaluated in the EIR/EIS.
- (c) The project area is located approximately 2.5 miles from the Mojave Air and Space Port, 10 miles from the California City Municipal Airport, 12.5 miles from the Mountain Valley Airport and 13 miles from the Tehachapi Municipal Airport. Due to the proximity of these airport facilities and the heights of project components, the EIR/EIS will evaluate potential impacts related to aviation safety hazards and compliance with the Kern County ALUCP, FAA 7460, and military airspace requirements.
- (d) A number of existing dirt roads within the project site would be graded, widened, and compacted to provide adequate construction and maintenance access to project facilities. New access roads would be constructed where required. Because all site access roadways would be private and gated to restrict public use, all modifications to existing onsite access roads and any new access roads created are not expected to result in an increase to public transportation hazards due to design or incompatible use. However, because all project access roads would require Access Road Design and Encroachment Permits from both Kern County and the California Department of Transportation, the project's compliance with regulations pertaining to access road modifications and construction will be evaluated in the EIR/EIS.
- (e) Construction of the project would generate construction trips and potential roadway lane closures that could temporarily increase the daily traffic volumes or delays on local roadways and intersections, thereby impeding emergency access. The potential for project-related traffic to result in inadequate emergency access will be evaluated in the EIR/EIS.



- (f) Construction of the project would generate construction trips and potential roadway lane closures that could temporarily disrupt bicycle traffic on local roadways. However, due to the rural nature of the project site area, no bus stops or designated bicycle lanes exist on the roadways likely to be used during project construction and operation. There is sufficient space on the project site to provide adequate parking. However, to ensure project compliance to the General Plan policies supporting alternative transportation, the EIR/EIS will discuss how the project's traffic impacts can be mitigated through ride sharing and limiting project-generated trips.



	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less Than Significant Impact	No Impact
UTILITIES AND SERVICE SYSTEMS. <i>Would the project:</i>				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☒	☐	☐	☐
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☒	☐	☐	☐
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☒	☐	☐	☐
g. Comply with federal, state, and local statutes and regulations related to solid waste?	☒	☐	☐	☐

Discussion:

- (a) The project would generate a minimal volume of wastewater. During construction and operation, wastewater from the concrete batch plant and that associated with other construction activities would be contained within portable facilities and disposed of at an approved site. During operation, the project would not generate substantial volumes of wastewater due to the minimal number of full-time or part-time employees. Impacts exceeding wastewater treatment requirements are expected to be less than significant; however, the EIR/EIS will consider these issues more thoroughly.
- (b) The project may require the construction of a septic system or leach lines; however, wastewater generation during construction and operation is expected to be limited due to the minimal employment associated with project operation. Water would be provided by a well or other water service (to serve non-potable demands) and by onsite well or bottled drinking water (to serve potable needs). Water that is needed for construction, such as for dust suppression and concrete mixing, would either be supplied from a new well on the project site or be trucked in from nearby municipalities. Since the project would provide its own water source, it would not impact existing water



supply systems. However, the project would still require construction of the facilities listed above. The EIR/EIS will evaluate the project's compliance with all applicable local, State, and federal water and wastewater requirements and best management practices incorporated into construction of these project features.

- (c) Although the project would create a small amount of additional impervious surface and may require a small amount of imported water for concrete mixing and dust suppression during construction, these changes are not expected to substantially increase the amount of stormwater runoff. The project area is drained by natural stream channels and does not rely on constructed stormwater drainage systems. As any new impervious surface and grading of access roads have the potential to alter the pattern and concentration of runoff, the EIR/EIS will provide further analysis to determine the need for any appropriate stormwater mitigation/design measures.
- (d) Drinking water would be provided by bottled water or onsite well. However, water that is needed for construction, such as for dust suppression and concrete mixing, would either be supplied from a new on-site well or be trucked in from nearby municipalities. A Water Supply Assessment will be prepared to analyze groundwater supplies and recharge in the project area. Therefore, the issue of new or expanded entitlements will be evaluated in the EIR/EIS.
- (e) The project would include construction of a limited septic system or leach lines to accommodate on-site operations facilities if required by the Kern County Environmental Health Services Division. There would be no substantial wastewater flows to treatment providers and no impacts to existing wastewater treatment facilities. Nevertheless, this issue will be evaluated in the EIR/EIS.
- (f) The project is not expected to generate a significant amount of waste that would exceed the capacity of local landfills. Materials brought to the project site would be used to construct facilities and few residual materials are expected. Non-hazardous construction refuse and solid waste would be disposed of at a local landfill, while any hazardous waste generated during project construction would be disposed of at an approved location. However, as the project would generate some level of waste during construction, the EIR/EIS will evaluate if the amount of solid waste generated by the project site would exceed the capacity of local landfills needed to accommodate the waste.
- (g) The project would generate solid waste during construction and operation, thus requiring the consideration of waste reduction and recycling measures. The 1989 California Integrated Waste Management Act (AB 939) requires Kern County to attain specific waste diversion goals. In addition, the California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires expanded or new development projects to incorporate storage areas for recycling bins into the project design. The need for mitigation measures to confirm that the project will comply with the 1989 California Integrated Waste Management Act and the 1991 California Solid Waste Reuse and Recycling Access Act of 1991, as amended will be evaluated in the EIR/EIS.



Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Potentially Significant Impact	Less Than Significant Impact	No Impact
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MANDATORY FINDINGS OF SIGNIFICANCE

- a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?
- b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?
- c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Discussion:

- (a) Impacts to biological resources are currently unknown. Biota studies for the project are currently being conducted. The EIR/EIS's biological resources section will discuss specific project impacts on plants and wildlife including avian species. The EIR/EIS will also evaluate the project's contribution to cumulative biological resources impacts and propose mitigation that will reduce the impacts.
- (b) The project has the potential to contribute to cumulative impacts to aesthetics, agricultural resources, air quality, biological resources, greenhouse gas emission, hydrology, land use and planning, noise, public services, and transportation and traffic. The EIR/EIS will evaluate the project's contribution to cumulative impacts in these and other areas as further impacts are identified.
- (c) Although there may be significant air quality impacts during construction, the long term air quality impacts could be beneficial if fossil fuel use is reduced. However, the health impacts from project-related and cumulative contribution to air quality impacts will be evaluated in the EIR/EIS.

Appendix K

USGS Mineral Resources On-Line Spatial Data Report



Mineral Resources On-Line Spatial Data

Mineral Resources > Online Spatial Data > Mineral Resources Data System

Data for 10163519

Report shows selected fields. [[Full report](#)]

Show this location using [Google Earth](#) or [Google Maps](#)

Site identification

Deposit identification number	10163519
MRDS identification number	
MAS/MILS identification number	0060290890
Name of the site, deposit, or operation	Unnamed Uranium Occurrence
Previous names	Uranium Prospect

Geographic location

Latitude	35.10309
Longitude	-118.19261
Geographic region	NA
Country name	United States
State name	California
County name	Kern

Site characteristics

Operation type	Unknown
Deposit type	
Production size	
Development status	Occurrence
Ore minerals or materials	
Gangue minerals or materials	
Other minerals or materials	
Ore body form	
Workings type	
Mineral deposit model	
Alteration processes	
Concentration processes	

Ore controls

Reporter

Raney, Russell G.

Host rock unit name

Host rock type

Associated rock unit name

Associated rock type

Structural characteristics

Tectonic setting

References

**{Deposit:: SOUTHERN PACIFIC CO., 1964,
MINERALS FOR INDUSTRY, V. III-}
{Deposit:: SOUTHERN CALIFORNIA, P.
63.}**

Modifier for YR_FST_PRD

Year of first production

Modifier for YR_LST_PRD

Year of last production

Modifier for DISC_YR

Discovery year

Production years

Discoverer

Commodities

Commodity type

M

Primary commodities

Uranium

Secondary commodities

Tertiary commodities

(16 fields contain data)

U.S. Department of the Interior | U.S. Geological Survey

URL: <http://tin.er.usgs.gov/mrds/show.php?labno=10163519>Page Contact Information: pschweitzer@usgs.gov

Page Last modified: 12:07 on 13-Mar-2012



Mineral Resources On-Line Spatial Data

Mineral Resources > Online Spatial Data > Mineral Resource Data System (MRDS)

Unnamed Uranium Occurrence

Occurrence in Kern county in California, United States with commodity Uranium

[View location using Google Earth]

Sections of this page: [Geologic] - [Economic] - [Reference]

Geologic Information

Identification information

Deposit ID **10163519**

MAS/MILS ID **0060290890**

Record type **Site**

Current site name **Unnamed Uranium Occurrence**

Alternate or previous names **Uranium Prospect**

Geographic coordinates

Point of reference **Ore Body**

Geographic coordinates: **-118.192610, 35.103090 (WGS84)**

Elevation **969**

Location accuracy **1000 (meters)**

Geographic context: *Political divisions (FIPS codes)*

Kern (county)

California (state)

United States (country)

North America (continent)

Land (continent)

USGS map quadrangles

Mojave (quadrangle 1:24,000 scale)

Tehachapi (quadrangle 1:100,000 scale)

Bakersfield (quadrangle 1:250,000 scale)

Hydrologic units (watersheds)

Antelope-Fremont Valleys (hydrologic unit)

Northern Mojave (hydrologic accounting unit)

Northern Mojave-Mono Lake (hydrologic subregion)

California (hydrologic region)

Geographic areas

Country	State	County
United States	California	Kern

Public Land Survey System information

Meridian	Township	Range	Section	Fraction	State
Mount Diablo	032 S	035 E	35		California

*Commodities**Commodity Importance of the commodity*

Uranium Primary

*Geologic units near the site, calculated from the appropriate geologic map*Ore Body (1) **-118.192610, 35.103090**

Economic Information

*Economic information about the deposit and operations*Development status **Occurrence**Commodity type **Metallic**Significant **No**

*Mineral rights holdings*Type of mineral rights **Unknown**

*Land status*Ownership category **Unknown**

Reference information

Links to other databases

Agency	Database name	Acronym	Record ID	Notes
U.S. Bureau of Mines (no longer exists)	Minerals Availability System	MAS	0060290890	

Bibliographic references

Subject category Reference

Deposit SOUTHERN PACIFIC CO., 1964, MINERALS FOR INDUSTRY, V. III-
Deposit SOUTHERN CALIFORNIA, P. 63.

Reporter information

Type	Date	Name	Affiliation	Comment
Reporter	31-MAR-1991	Raney, Russell G.	U.S. Bureau of Mines	

Date and time this information drawn from the master database: **2012-01-17 14:49:42**

Show this information as [XML]

U.S. Department of the Interior | U.S. Geological Survey
URL: http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10163519
Page Contact Information: Peter Schweitzer

Appendix L

EDR Report

EDR Data View - Area 501

Alta Infill II

Mojave, CA 93501

Inquiry Number: 3117009.1s

July 12, 2011

EDR DataMap™ Area Study



EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

TARGET PROPERTY INFORMATION

ADDRESS

MOJAVE, CA 93501
MOJAVE, CA 93501

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records within the requested search area for the following databases:

FEDERAL RECORDS

NPL.....	National Priority List
Proposed NPL.....	Proposed National Priority List Sites
Delisted NPL.....	National Priority List Deletions
NPL LIENS.....	Federal Superfund Liens
CERCLIS.....	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP.....	CERCLIS No Further Remedial Action Planned
LIENS 2.....	CERCLA Lien Information
CORRACTS.....	Corrective Action Report
RCRA-TSDF.....	RCRA - Treatment, Storage and Disposal
RCRA-LQG.....	RCRA - Large Quantity Generators
RCRA-SQG.....	RCRA - Small Quantity Generators
RCRA-CESQG.....	RCRA - Conditionally Exempt Small Quantity Generator
RCRA-NonGen.....	RCRA - Non Generators
US ENG CONTROLS.....	Engineering Controls Sites List
US INST CONTROL.....	Sites with Institutional Controls
ERNS.....	Emergency Response Notification System
HMIRS.....	Hazardous Materials Information Reporting System
DOT OPS.....	Incident and Accident Data
US CDL.....	Clandestine Drug Labs
US BROWNFIELDS.....	A Listing of Brownfields Sites
DOD.....	Department of Defense Sites
FUDS.....	Formerly Used Defense Sites
LUCIS.....	Land Use Control Information System
CONSENT.....	Superfund (CERCLA) Consent Decrees
ROD.....	Records Of Decision
UMTRA.....	Uranium Mill Tailings Sites
ODI.....	Open Dump Inventory
DEBRIS REGION 9.....	Torres Martinez Reservation Illegal Dump Site Locations
MINES.....	Mines Master Index File
TRIS.....	Toxic Chemical Release Inventory System
TSCA.....	Toxic Substances Control Act
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS.....	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS.....	Section 7 Tracking Systems

EXECUTIVE SUMMARY

ICIS.....	Integrated Compliance Information System
PADS.....	PCB Activity Database System
MLTS.....	Material Licensing Tracking System
RADINFO.....	Radiation Information Database
FINDS.....	Facility Index System/Facility Registry System
RAATS.....	RCRA Administrative Action Tracking System
SCRD DRYCLEANERS.....	State Coalition for Remediation of Drycleaners Listing
COAL ASH EPA.....	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER.....	PCB Transformer Registration Database
COAL ASH DOE.....	Sleam-Electric Plan Operation Data
FEDERAL FACILITY.....	Federal Facility Site Information listing
FEMA UST.....	Underground Storage Tank Listing
US HIST CDL.....	National Clandestine Laboratory Register

STATE AND LOCAL RECORDS

HIST Cal-Sites.....	Historical Calsites Database
CA BOND EXP. PLAN.....	Bond Expenditure Plan
SCH.....	School Property Evaluation Program
Toxic Pits.....	Toxic Pits Cleanup Act Sites
SWF/LF.....	Solid Waste Information System
WDS.....	Waste Discharge System
NPDES.....	NPDES Permits Listing
Cortese.....	"Cortese" Hazardous Waste & Substances Sites List
HIST CORTESE.....	Hazardous Waste & Substance Site List
SWRCY.....	Recycler Database
LUST.....	Geotracker's Leaking Underground Fuel Tank Report
CA FID UST.....	Facility Inventory Database
SLIC.....	Statewide SLIC Cases
UST.....	Active UST Facilities
HIST UST.....	Hazardous Substance Storage Container Database
LIENS.....	Environmental Liens Listing
SWEEPS UST.....	SWEEPS UST Listing
CHMIRS.....	California Hazardous Material Incident Report System
LDS.....	Land Disposal Sites Listing
MCS.....	Military Cleanup Sites Listing
AST.....	Aboveground Petroleum Storage Tank Facilities
Notify 65.....	Proposition 65 Records
DEED.....	Deed Restriction Listing
VCP.....	Voluntary Cleanup Program Properties
DRYCLEANERS.....	Cleaner Facilities
WIP.....	Well Investigation Program Case List
CDL.....	Clandestine Drug Labs
RESPONSE.....	State Response Sites
EMI.....	Emissions Inventory Data
HAULERS.....	Registered Waste Tire Haulers Listing
HWT.....	Registered Hazardous Waste Transporter Database
HWP.....	EnviroStor Permitted Facilities Listing
MWMP.....	Medical Waste Management Program Listing
PROC.....	Certified Processors Database

TRIBAL RECORDS

INDIAN RESERV.....	Indian Reservations
INDIAN ODI.....	Report on the Status of Open Dumps on Indian Lands

EXECUTIVE SUMMARY

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land
INDIAN UST..... Underground Storage Tanks on Indian Land
INDIAN VCP..... Voluntary Cleanup Priority Listing

EDR PROPRIETARY RECORDS

Manufactured Gas Plants..... EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STATE AND LOCAL RECORDS

WMUDS/SWAT: The Waste Management Unit Database System is used for program tracking and inventory of waste management units. The source is the State Water Resources Control Board.

A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 WMUDS/SWAT site within the searched area.

<u>Site</u>	<u>Address</u>	<u>Map ID</u>	<u>Page</u>
<i>SOLEDAD MOUNTAIN PROJECT</i>	<i>11847 GEMPEN ST</i>	<i>2</i>	<i>4</i>

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

A review of the HAZNET list, as provided by EDR, and dated 12/31/2009 has revealed that there is 1 HAZNET site within the searched area.

<u>Site</u>	<u>Address</u>	<u>Map ID</u>	<u>Page</u>
<i>SOLEDAD MOUNTAIN PROJECT</i>	<i>11847 GEMPEN ST</i>	<i>2</i>	<i>4</i>

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to,

EXECUTIVE SUMMARY

identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 05/10/2011 has revealed that there is 1 ENVIROSTOR site within the searched area.

<u>Site</u>	<u>Address</u>	<u>Map ID</u>	<u>Page</u>
PRIMARY GOLD COMPANY Status: Inactive - Needs Evaluation	1/2 MI N OF SILVER QUEE	1	3

EXECUTIVE SUMMARY

Please refer to the end of the findings report for unmapped orphan sites due to poor or inadequate address information.

MAP FINDINGS SUMMARY

<u>Database</u>	<u>Total Plotted</u>
<u>FEDERAL RECORDS</u>	
NPL	0
Proposed NPL	0
Delisted NPL	0
NPL LIENS	0
CERCLIS	0
CERC-NFRAP	0
LIENS 2	0
CORRACTS	0
RCRA-TSDF	0
RCRA-LQG	0
RCRA-SQG	0
RCRA-CESQG	0
RCRA-NonGen	0
US ENG CONTROLS	0
US INST CONTROL	0
ERNS	0
HMIRS	0
DOT OPS	0
US CDL	0
US BROWNFIELDS	0
DOD	0
FUDS	0
LUCIS	0
CONSENT	0
ROD	0
UMTRA	0
ODI	0
DEBRIS REGION 9	0
MINES	0
TRIS	0
TSCA	0
FTTS	0
HIST FTTS	0
SSTS	0
ICIS	0
PADS	0
MLTS	0
RADINFO	0
FINDS	0
RAATS	0
SCRD DRYCLEANERS	0
COAL ASH EPA	0
PCB TRANSFORMER	0
COAL ASH DOE	0
FEDERAL FACILITY	0
FEMA UST	0
US HIST CDL	0
<u>STATE AND LOCAL RECORDS</u>	
HIST Cal-Sites	0

MAP FINDINGS SUMMARY

Database	Total Plotted
CA BOND EXP. PLAN	0
SCH	0
Toxic Pits	0
SWF/LF	0
WDS	0
NPDES	0
WMUDS/SWAT	1
Cortese	0
HIST CORTESE	0
SWRCY	0
LUST	0
CA FID UST	0
SLIC	0
UST	0
HIST UST	0
LIENS	0
SWEEPS UST	0
CHMIRS	0
LDS	0
MCS	0
AST	0
Notify 65	0
DEED	0
VCP	0
DRYCLEANERS	0
WIP	0
CDL	0
RESPONSE	0
HAZNET	1
EMI	0
ENVIROSTOR	1
HAULERS	0
HWT	0
HWP	0
MWMP	0
PROC	0
TRIBAL RECORDS	
INDIAN RESERV	0
INDIAN ODI	0
INDIAN LUST	0
INDIAN UST	0
INDIAN VCP	0
EDR PROPRIETARY RECORDS	
Manufactured Gas Plants	0

NOTES:

Sites may be listed in more than one database

MAP FINDINGS

Map ID
Direction
Distance
Distance (ft.)Site

EDR ID Number

Database(s) EPA ID Number

1 PRIMARY GOLD COMPANY
1/2 MI N OF SILVER QUEEN RD (T11NR12S32)
MOJAVE, CA 93501
ENVIROSTOR S101480461
N/A

ENVIROSTOR:

Site Type: Historical
Site Type Detailed: * Historical
Acres: 1
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Thomas Kovac
Division Branch: San Joaquin & Legacy
Facility ID: 15330012
Site Code: Not reported
Assembly: 34
Senate: 18
Special Program: Not reported
Status: Inactive - Needs Evaluation
Status Date: 1990-12-28 00:00:00
Restricted Use: NO
Site Mgmt. Req.: NONE SPECIFIED
Funding: Not reported
Latitude: 34.9996
Longitude: -118.1455
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 15330012
Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 1990-08-02 00:00:00
Comments: ON CORTESE LIST. INSPECTION(STATE) SURVEILLANCE & ENFORCEMENT INSPECTED SITE. POSSIBLE CORROSIVES WERE DUMPED INTO THE SUMP. SLAG-LIKE MATERIAL IN CONTAINERS OBSERVED IN YARD. GROUND PHOTOS. DRUMS LABELED "CORROSIVE". AREA DISCOLORED WHERE SUMP ONCE EXISTED. LACK OF VEGETATION. OPEN AND UNLABELED DRUMS. SITE SCREENING DONE. RECOMMEND PRELIMINARY ENDANGERMENT ASSESSMENT (HIGH PRIORITY) TO DETERMINE THE NATURE OF THE RELEASE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 1990-07-30 00:00:00
Comments: SURVEILLANCE & ENFORCEMENT RECEIVED A COMPLAINT STATING WASTES WERE ABANDONED BY RENTER. COMPLAINT WAS REFERRED FROM KERN COUNTY HEALTH DEPARTMENT.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported

MAP FINDINGS

Map ID
Direction
Distance
Distance (ft.)Site

EDR ID Number

Database(s) EPA ID Number

PRIMARY GOLD COMPANY (Continued)

S101480461

Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

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SOLEDAD MOUNTAIN PROJECT
11847 GEMPEN ST
MOJAVE CA, CA 93502

WMUDS/SWAT S103340924
HAZNET N/A

WMUDS/SWAT:

Edit Date: Not reported
Complexity: Category B - Any facility having a physical, chemical, or biological waste treatment system (except for septic systems with subsurface disposal), or any Class II or III disposal site, or facilities without treatment systems that are complex, such as marinas with petroleum products, solid wastes, and sewage pump out facilities.
Primary Waste: Process Waste (Waste produced as part of the industrial/manufacturing process)
Primary Waste Type: Hazardous/Influent or Solid Wastes that contain toxic, corrosive, ignitable or reactive substances and must be managed according to applicable DOHS standards.
Secondary Waste: Not reported
Secondary Waste Type: Not reported
Base Meridian: Not reported
NPID: Not reported
Tonnage: 0
Regional Board ID: Not reported
Municipal Solid Waste: False
Superorder: False
Open To Public: False
Waste List: False
Agency Type: Private
Agency Name: GOLDEN QUEEN MINING
Agency Department: Not reported
Agency Address: PO BOX 820
Agency City,St,Zip: MOJAVE CA 93502
Agency Contact: TONY CASAGRANDA
Agency Telephone: 8058241054
Land Owner Name: Not reported
Land Owner Address: Not reported
Land Owner City,St,Zip: Not reported
Land Owner Contact: Not reported
Land Owner Phone: Not reported
Region: 6V
Facility Type: Other - Does not fall into the category of Municipal/Domestic, Industrial, Agricultural or Solid Waste (Class I, II or III)
Facility Description: Not reported
Facility Telephone: Not reported
SWAT Facility Name: Not reported
Primary SIC: 1041
Secondary SIC: 1044
Comments: Not reported
Last Facility Editors: Not reported
Waste Discharge System: True
Solid Waste Assessment Test Program: False
Toxic Pits Cleanup Act Program: False
Resource Conservation Recovery Act: False
Department of Defence: False

MAP FINDINGS

Map ID
Direction
Distance
Distance (ft.)Site

EDR ID Number

Database(s) EPA ID Number

SOLEDAD MOUNTAIN PROJECT (Continued)

S103340924

Solid Waste Assessment Test Program: Not reported
Threat to Water Quality: Major Threat to Water Quality. A violation could render unusable a ground water or surface water resource used as a significant drink water supply, require closure of an area used for contact recreation, result in long-term deleterious effects on shell fish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.
Sub Chapter 15: True
Regional Board Project Officer: EL
Number of WMUDS at Facility: 1
Section Range: Not reported
RCRA Facility: No
Waste Discharge Requirements: Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
Self-Monitoring Rept. Frequency: Semiannual Submittal
Waste Discharge System ID: 6B159708001
Solid Waste Information ID: Not reported

HAZNET:

Year: 2002
Gepaid: CAC002551632
Contact: KEITH GAINEY
Telephone: 6618241054
Mailing Name: Not reported
Mailing Address: PO BOX 1030
Mailing City,St,Zip: MOJAVE, CA 93502
Gen County: Kern
TSD EPA ID: Not reported
TSD County: 99
Waste Category: Other organic solids
Disposal Method: R01
Tons: 4.00
Facility County: Not reported

City	EDR ID	Site Name	Site Address	Zip	Database(s)
KERN COUNTY	M300000909	NATIONAL CEMENT CO	LEBEC (LOS ROBLES PLANT)		MINES
KERN COUNTY	M300006767	CALIFORNIA PORTLAND CEMENT CO.	MOJAVE QUARRY		MINES
KERN COUNTY	M300000920	CALIFORNIA PORTLAND CEMENT CO	MOJAVE PLANT		MINES
KERN COUNTY	M200000046	GLAMIS RAND MINING CO	RAND MINE		MINES
KERN COUNTY	M200000116	GLAMIS RAND MINING CO	RAND MINE		MINES
KERN COUNTY	M300006012	GLAMIS RAND MINING CO	RAND MINE		MINES
KERN COUNTY	M300002205	GLAMIS RAND MINING CO	RAND MINE		MINES
MOJAVE	1000857527	CALTRANS CACHE CREEK BRIDGE	BR #50-201L P M R107.6 HWY 58	93501	RCRA-SQG, FINDS, HAZNET
MOJAVE	S104402896	UNKNOWN	HWY 14		HIST CORTESE
MOJAVE	U003879720	OASIS CENTER	16825 HWY 14	93501	UST
MOJAVE	S110654361	CALTRANS MOJAVE MAINTENANCE	HWY 14	93501	LUST
MOJAVE	U004113451	LEONARD CONSTRUCTION	HWY 14 & HWY 58	93501	UST
MOJAVE	U004113897	OASIS CLUB INC	16825 HWY 14	93501	UST
MOJAVE	S110654356	LEONARD CONSTRUCTION	HWY 14		LUST
MOJAVE	S102432601	LEONARD CONSTRUCTION	HWY 14	93501	LUST
MOJAVE	S102426217	CALTRANS MOJAVE MAINTENANCE	HWY 14	93501	HIST CORTESE, LUST
MOJAVE	A100340127	AT T/PACIFIC BELL(CA7004)	HWY 14	93501	LUST
MOJAVE	A100337512	RED ROCK CANYON STATE PARK	HWY 58 9 MI E OF MOJAVE	93501	AST
MOJAVE	1011488070	MOJAVE	NW ABBOTT AND HWY 14	00000	AST
MOJAVE	S106927719	JAMIESON HILL STATION #703	CAMELOT BLVD ON HOLT ST	93501	RCRA-NonGen
MOJAVE	U003731285	AT AND T (CAO580)	SE CORNER HWY 58 / 14	93501	SWEEPS UST
MOJAVE	A100337776	P G AND E - SEPARATOR STATION MOJAV	9 MI E OF MOJAVE	93501	UST
MOJAVE	A100338776	KEMIRA WATER SOLUTIONS INC.	HOLT	93501	AST
MOJAVE	1000251223	PACIFIC BELL	18700 N HWY 14	93501	AST
MOJAVE	U004113453	TANK FARM A-EAST KERN AIRPORT	9 MILE E/O MOJAVE	93501	RCRA-NonGen
MOJAVE	U004113454	TANK FARM B-EAST KERN AIRPORT	MOJAVE AIRPORT	93501	UST
MOJAVE	U004113456	TANK FARM D-EAST KERN AIRPORT	MOJAVE AIRPORT	93501	UST
MOJAVE	U004113616	FORMER MARINE CORP AIR STATION	MOJAVE AIRPORT	93501	UST
MOJAVE	U004113455	TANK FARM C-EAST KERN AIRPORT	MOJAVE AIRPORT	93501	UST
MOJAVE	S104574174	FORMER MARINE CORPS AIR STATION - UST #1	MOJAVE AIRPORT	93501	LUST, HAZNET
MOJAVE	S110654374	FORMER MARINE CORPS AIR STATION - UST #1	MOJAVE AIRPORT	93501	LUST
MOJAVE	S105025019	PRIMARY GOLD COMPANY	1/2 MI N. OF SILVER QUEEN	93501	HIST CORTESE
MOJAVE	S106027450	EAST KERN AIRPORT DISTRICT	P O BOX 711 MOJAVE A	93501	CA FID UST, SWEEPS UST
MOJAVE	1003879873	MOJAVE BURN DUMP	2M S OF HWY 58/2M E OF MOJAVE	93501	CERC-NFRAP
MOJAVE	1004676086	P G & E MOJAVE FILTER SEPARATOR	W SIDE OF HOLT ST	93501	RCRA-SQG, FINDS
MOJAVE	U003940331	LA DEPT OF WATER & POWER	17031 SIERRA HWY	93501	UST
MOJAVE	U003981688	GIANT TRUCK STOP OF MOJAVE	16600 SIERRA HWY	93501	UST
MOJAVE	S110913195	DEPARTMENT OF WATER & POWER	16899 SIERRA HWY	93501	MANIFEST
MOJAVE	1003879941	VICTORY MILLSITE (A & W SMELTER)	SILVER QUEEN ROAD	93501	CERC-NFRAP
MOJAVE	1000131928	A&W SMELTER AND REFINERS	SILVER QUEEN RD	93501	CERCLIS, RCRA-SQG, FINDS, HIST
MOJAVE	S106926720	GILBERT E. COOK	STAR RT 1 BOX 54E	93501	CORTESE, HAZNET
MOJAVE	U003939704	FASTRIP #38	2350 STATE HIGHWAY 58	93501	SWEEPS UST

Count: 64 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MOJAVE	U003981691	PRICE SAVERS TRUCK STOP	2001 STATE HIGHWAY 58	93501	UST
MOJAVE	A100337391	SUNSHINE TRUCK WORLD	2001 STATE HIGHWAY 58	93501	AST
MOJAVE	U004113231	SHAHNAZ ENT	1155 STATE HIGHWAY 58	93501	UST
MOJAVE	U004113441	KERN COUNTY FIRE DEPT STATION 14	1953 STATE HIGHWAY 58	93501	UST
MOJAVE	U004113445	CALIF HWY PATROL-MOJAVE	1365 STATE HIGHWAY 58	93501	UST
MOJAVE	U004113452	MR. LEE PULSIPHER	1875 STATE HIGHWAY 58	93501	UST
MOJAVE	U004113898	LA DEPT OF WATER AND POWER, MOJAVE	17031 STATE HIGHWAY 14	93501	UST
MOJAVE	U004113901	FASTRIP FOOD STORE #38	2350 STATE HIGHWAY 58	93501	UST
MOJAVE	U004127340	SUNSHINE TRUCK WORLD	2001 STATE HIGHWAY 58	93501	UST
MOJAVE	S106027443	CALIFORNIA HIGHWAY PATROL	1365 STATE HIGHWAY 58	93501	CA FID UST, SWEEPS UST
MOJAVE	S106027449	FIRE STATION #14	1953 STATE HIGHWAY 58	93501	CA FID UST, SWEEPS UST
MOJAVE	S106922696	ANGELES TRUCK STOP	2001 STATE HIGHWAY 58	93501	SWEEPS UST
CA	S101612519	MOJAVE PLANT NO 55	SOUTH OF MOJAVE	93501	VMUDS/SWAT, WDS
CA	S100838392	MOJAVE/ROSAMOND LANDFILL	3 MI SOUTH OF MOJAVE	93501	VMUDS/SWAT
MONOLITH	1002850739	CALAVERAS CEMENT CORP	OLD HIGHWAY 58	93561	CERC-NFRAP
TEHACHAPI	S105027040	CALIFORNIA CORRECTIONAL I	HWY 202 P.O. BOX 1031	93561	HIST CORTESE
TEHACHAPI	S101630912	HOWARDS MARKET	HWY 202 TUCKER NEC RD	93561	CA FID UST, SWEEPS UST
TEHACHAPI	U004113913	TEHACHAPI MINUTE SERVE DAIRY	20521 HWY 202	93561	UST
TEHACHAPI	A100339938	CCI TEHACHAPI	24900 HWY 202	93561	AST
TEHACHAPI	U001587149	CALIFORNIA CORRECTIONAL INSTT	END OF HIGHWAY 202	93561	HIST UST
TEHACHAPI	U001587148	CALIFORNIA CORRECTIONAL INST.	END OF HIGHWAY 202	93561	HIST UST
TEHACHAPI	A100338157	OAK TREE COUNTRY CLUB MAINT BLDG	29541 ROLLING OAK	93561	AST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/09/2011
Date Data Arrived at EDR: 03/15/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 91

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

RCRA-NonGen: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/16/2011
Date Data Arrived at EDR: 03/25/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/16/2011
Date Data Arrived at EDR: 03/25/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 04/05/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 70

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/05/2011
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 51

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Annually

DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/12/2011
Date Data Arrived at EDR: 02/11/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 80

Source: Department of Transportation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/11/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/02/2011
Date Data Arrived at EDR: 03/17/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 46

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 06/07/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: Quarterly

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 03/29/2011
Date Data Arrived at EDR: 03/29/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Semi-Annually

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 07/11/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 70

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/16/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 5

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/15/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/21/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 99

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 06/02/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/08/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/08/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
 Date Data Arrived at EDR: 12/17/2010
 Date Made Active in Reports: 03/21/2011
 Number of Days to Update: 94

Source: EPA
 Telephone: 202-566-0250
 Last EDR Contact: 05/27/2011
 Next Scheduled EDR Contact: 09/12/2011
 Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
 Date Data Arrived at EDR: 09/29/2010
 Date Made Active in Reports: 12/02/2010
 Number of Days to Update: 64

Source: EPA
 Telephone: 202-260-5521
 Last EDR Contact: 06/30/2011
 Next Scheduled EDR Contact: 10/10/2011
 Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
 Date Data Arrived at EDR: 04/16/2009
 Date Made Active in Reports: 05/11/2009
 Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
 Telephone: 202-566-1667
 Last EDR Contact: 05/27/2011
 Next Scheduled EDR Contact: 09/12/2011
 Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
 Date Data Arrived at EDR: 04/16/2009
 Date Made Active in Reports: 05/11/2009
 Number of Days to Update: 25

Source: EPA
 Telephone: 202-566-1667
 Last EDR Contact: 05/27/2011
 Next Scheduled EDR Contact: 09/12/2011
 Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
 Date Data Arrived at EDR: 03/01/2007
 Date Made Active in Reports: 04/10/2007
 Number of Days to Update: 40

Source: Environmental Protection Agency
 Telephone: 202-564-2501
 Last EDR Contact: 12/17/2007
 Next Scheduled EDR Contact: 03/17/2008
 Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/07/2011
Date Data Arrived at EDR: 01/21/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 59

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/22/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/18/2010
Date Data Arrived at EDR: 04/06/2010
Date Made Active in Reports: 05/27/2010
Number of Days to Update: 51

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/11/2011
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/14/2010	Source: EPA
Date Data Arrived at EDR: 04/16/2010	Telephone: (415) 947-8000
Date Made Active in Reports: 05/27/2010	Last EDR Contact: 06/14/2011
Number of Days to Update: 41	Next Scheduled EDR Contact: 09/26/2011
	Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009	Source: EPA/NTIS
Date Data Arrived at EDR: 03/01/2011	Telephone: 800-424-9346
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 05/27/2011
Number of Days to Update: 62	Next Scheduled EDR Contact: 09/12/2011
	Data Release Frequency: Biennially

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA's Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/10/2010	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/11/2011	Telephone: 703-603-8704
Date Made Active in Reports: 02/16/2011	Last EDR Contact: 04/15/2011
Number of Days to Update: 36	Next Scheduled EDR Contact: 07/25/2011
	Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007	Source: Drug Enforcement Administration
Date Data Arrived at EDR: 11/19/2008	Telephone: 202-307-1000
Date Made Active in Reports: 03/30/2009	Last EDR Contact: 03/23/2009
Number of Days to Update: 131	Next Scheduled EDR Contact: 06/22/2009
	Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 01/01/2008

Date Data Arrived at EDR: 02/18/2009

Date Made Active in Reports: 05/29/2009

Number of Days to Update: 100

Source: Environmental Protection Agency

Telephone: 202-566-0517

Last EDR Contact: 05/05/2011

Next Scheduled EDR Contact: 08/15/2011

Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005

Date Data Arrived at EDR: 08/07/2009

Date Made Active in Reports: 10/22/2009

Number of Days to Update: 76

Source: Department of Energy

Telephone: 202-586-8719

Last EDR Contact: 04/19/2011

Next Scheduled EDR Contact: 08/01/2011

Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010

Date Data Arrived at EDR: 02/16/2010

Date Made Active in Reports: 04/12/2010

Number of Days to Update: 55

Source: FEMA

Telephone: 202-646-5797

Last EDR Contact: 04/18/2011

Next Scheduled EDR Contact: 08/01/2011

Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010

Date Data Arrived at EDR: 01/03/2011

Date Made Active in Reports: 03/21/2011

Number of Days to Update: 77

Source: Environmental Protection Agency

Telephone: N/A

Last EDR Contact: 06/14/2011

Next Scheduled EDR Contact: 09/26/2011

Data Release Frequency: Varies

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011

Date Data Arrived at EDR: 03/09/2011

Date Made Active in Reports: 05/02/2011

Number of Days to Update: 54

Source: Environmental Protection Agency

Telephone: 615-532-8599

Last EDR Contact: 06/06/2011

Next Scheduled EDR Contact: 08/08/2011

Data Release Frequency: Varies

STATE AND LOCAL RECORDS

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005

Date Data Arrived at EDR: 08/03/2006

Date Made Active in Reports: 08/24/2006

Number of Days to Update: 21

Source: Department of Toxic Substance Control

Telephone: 916-323-3400

Last EDR Contact: 02/23/2009

Next Scheduled EDR Contact: 05/25/2009

Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/16/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inventory of solid waste disposal facilities or landfills. These may be active or inactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/23/2011
Date Data Arrived at EDR: 05/24/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 22

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/24/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: No Update Planned

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 05/24/2011
Date Data Arrived at EDR: 05/24/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 22

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/24/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites). This listing is no longer updated by the state agency.

Date of Government Version: 04/05/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 29

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES].

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 02/24/2011
Date Data Arrived at EDR: 03/23/2011
Date Made Active in Reports: 04/21/2011
Number of Days to Update: 29

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 06/20/2011
Date Data Arrived at EDR: 06/21/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 17

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calaveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 06/06/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 06/20/2011
Date Data Arrived at EDR: 06/21/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 17

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 7: SLIC List

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/13/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 05/09/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Annually

UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/20/2011
Date Data Arrived at EDR: 06/21/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 17

Source: SWRCB
Telephone: 916-480-1028
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Semi-Annually

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 06/06/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/28/2011
Date Data Arrived at EDR: 06/29/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 9

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 05/03/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 43

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 06/20/2011
Date Data Arrived at EDR: 06/21/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 17

Source: State Water Quality Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

AST: Aboveground Petroleum Storage Tank Facilities Registered Aboveground Storage Tanks.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 916-341-5712
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 10/24/2011
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 06/20/2011
Date Data Arrived at EDR: 06/21/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 17

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: No Update Planned

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/18/2011
Date Data Arrived at EDR: 03/18/2011
Date Made Active in Reports: 04/20/2011
Number of Days to Update: 33

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Semi-Annually

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/16/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 09/15/2010
Date Data Arrived at EDR: 09/16/2010
Date Made Active in Reports: 09/29/2010
Number of Days to Update: 13

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 03/04/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 20

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/16/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Quarterly

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 07/07/2010
Date Made Active in Reports: 08/12/2010
Number of Days to Update: 36

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/22/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 10/18/2010
Number of Days to Update: 19

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/30/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Varies

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 05/24/2011
Date Data Arrived at EDR: 05/24/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 22

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/24/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Varies

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/16/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/09/2010

Date Data Arrived at EDR: 08/11/2010

Date Made Active in Reports: 08/20/2010

Number of Days to Update: 9

Source: Department of Toxic Substances Control

Telephone: 916-323-3400

Last EDR Contact: 06/03/2011

Next Scheduled EDR Contact: 09/12/2011

Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 04/19/2011

Date Data Arrived at EDR: 04/19/2011

Date Made Active in Reports: 05/12/2011

Number of Days to Update: 23

Source: Department of Toxic Substances Control

Telephone: 916-440-7145

Last EDR Contact: 04/19/2011

Next Scheduled EDR Contact: 08/01/2011

Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 03/04/2011

Date Data Arrived at EDR: 03/17/2011

Date Made Active in Reports: 04/20/2011

Number of Days to Update: 34

Source: Department of Public Health

Telephone: 916-558-1784

Last EDR Contact: 06/14/2011

Next Scheduled EDR Contact: 09/26/2011

Data Release Frequency: Varies

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 02/28/2011

Date Data Arrived at EDR: 03/23/2011

Date Made Active in Reports: 04/21/2011

Number of Days to Update: 29

Source: Department of Conservation

Telephone: 916-323-3836

Last EDR Contact: 06/21/2011

Next Scheduled EDR Contact: 10/03/2011

Data Release Frequency: Quarterly

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005

Date Data Arrived at EDR: 12/08/2006

Date Made Active in Reports: 01/11/2007

Number of Days to Update: 34

Source: USGS

Telephone: 202-208-3710

Last EDR Contact: 04/21/2011

Next Scheduled EDR Contact: 08/01/2011

Data Release Frequency: Semi-Annually

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998

Date Data Arrived at EDR: 12/03/2007

Date Made Active in Reports: 01/24/2008

Number of Days to Update: 52

Source: Environmental Protection Agency

Telephone: 703-308-8245

Last EDR Contact: 05/09/2011

Next Scheduled EDR Contact: 08/22/2011

Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 03/03/2011	Source: EPA Region 4
Date Data Arrived at EDR: 03/18/2011	Telephone: 404-562-8677
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 05/02/2011
Number of Days to Update: 45	Next Scheduled EDR Contact: 08/15/2011
	Data Release Frequency: Semi-Annually

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 11/04/2009	Source: EPA Region 7
Date Data Arrived at EDR: 05/04/2010	Telephone: 913-551-7003
Date Made Active in Reports: 07/07/2010	Last EDR Contact: 05/04/2010
Number of Days to Update: 64	Next Scheduled EDR Contact: 05/16/2011
	Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 03/07/2011	Source: EPA Region 1
Date Data Arrived at EDR: 05/20/2011	Telephone: 617-918-1313
Date Made Active in Reports: 06/14/2011	Last EDR Contact: 05/03/2011
Number of Days to Update: 25	Next Scheduled EDR Contact: 08/15/2011
	Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/16/2011	Source: EPA Region 8
Date Data Arrived at EDR: 05/17/2011	Telephone: 303-312-6271
Date Made Active in Reports: 06/14/2011	Last EDR Contact: 05/02/2011
Number of Days to Update: 28	Next Scheduled EDR Contact: 08/15/2011
	Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/31/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/01/2011	Telephone: 415-972-3372
Date Made Active in Reports: 03/21/2011	Last EDR Contact: 05/02/2011
Number of Days to Update: 48	Next Scheduled EDR Contact: 08/15/2011
	Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/17/2011	Source: EPA Region 10
Date Data Arrived at EDR: 05/19/2011	Telephone: 206-553-2857
Date Made Active in Reports: 06/14/2011	Last EDR Contact: 05/02/2011
Number of Days to Update: 26	Next Scheduled EDR Contact: 08/15/2011
	Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/10/2011	Source: EPA Region 6
Date Data Arrived at EDR: 05/11/2011	Telephone: 214-665-6597
Date Made Active in Reports: 06/14/2011	Last EDR Contact: 05/02/2011
Number of Days to Update: 34	Next Scheduled EDR Contact: 08/15/2011
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 05/17/2011

Date Data Arrived at EDR: 05/19/2011

Date Made Active in Reports: 06/14/2011

Number of Days to Update: 26

Source: EPA Region 10

Telephone: 206-553-2857

Last EDR Contact: 05/02/2011

Next Scheduled EDR Contact: 08/15/2011

Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 05/18/2011

Date Data Arrived at EDR: 05/26/2011

Date Made Active in Reports: 06/14/2011

Number of Days to Update: 19

Source: EPA Region 9

Telephone: 415-972-3368

Last EDR Contact: 05/02/2011

Next Scheduled EDR Contact: 08/15/2011

Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/16/2011

Date Data Arrived at EDR: 05/17/2011

Date Made Active in Reports: 06/14/2011

Number of Days to Update: 28

Source: EPA Region 8

Telephone: 303-312-6137

Last EDR Contact: 05/02/2011

Next Scheduled EDR Contact: 08/15/2011

Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/01/2011

Date Data Arrived at EDR: 06/01/2011

Date Made Active in Reports: 06/14/2011

Number of Days to Update: 13

Source: EPA Region 7

Telephone: 913-551-7003

Last EDR Contact: 02/03/2011

Next Scheduled EDR Contact: 05/16/2011

Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011

Date Data Arrived at EDR: 05/11/2011

Date Made Active in Reports: 06/14/2011

Number of Days to Update: 34

Source: EPA Region 6

Telephone: 214-665-7591

Last EDR Contact: 05/02/2011

Next Scheduled EDR Contact: 08/15/2011

Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 01/01/2011

Date Data Arrived at EDR: 02/23/2011

Date Made Active in Reports: 05/02/2011

Number of Days to Update: 68

Source: EPA Region 5

Telephone: 312-886-6136

Last EDR Contact: 05/02/2011

Next Scheduled EDR Contact: 08/15/2011

Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 03/03/2011
 Date Data Arrived at EDR: 03/18/2011
 Date Made Active in Reports: 05/02/2011
 Number of Days to Update: 45

Source: EPA Region 4
 Telephone: 404-562-9424
 Last EDR Contact: 05/02/2011
 Next Scheduled EDR Contact: 08/15/2011
 Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 03/07/2011
 Date Data Arrived at EDR: 05/04/2011
 Date Made Active in Reports: 06/14/2011
 Number of Days to Update: 41

Source: EPA, Region 1
 Telephone: 617-918-1313
 Last EDR Contact: 05/03/2011
 Next Scheduled EDR Contact: 08/15/2011
 Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 02/25/2011
 Date Data Arrived at EDR: 04/05/2011
 Date Made Active in Reports: 06/14/2011
 Number of Days to Update: 70

Source: EPA, Region 1
 Telephone: 617-918-1102
 Last EDR Contact: 07/05/2011
 Next Scheduled EDR Contact: 10/17/2011
 Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
 Date Data Arrived at EDR: 04/22/2008
 Date Made Active in Reports: 05/19/2008
 Number of Days to Update: 27

Source: EPA, Region 7
 Telephone: 913-551-7365
 Last EDR Contact: 04/20/2009
 Next Scheduled EDR Contact: 07/20/2009
 Data Release Frequency: Varies

EDR PROPRIETARY RECORDS**Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants**

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
 Date Data Arrived at EDR: N/A
 Date Made Active in Reports: N/A
 Number of Days to Update: N/A

Source: EDR, Inc.
 Telephone: N/A
 Last EDR Contact: N/A
 Next Scheduled EDR Contact: N/A
 Data Release Frequency: No Update Planned

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 04/12/2011
Date Data Arrived at EDR: 04/15/2011
Date Made Active in Reports: 05/12/2011
Number of Days to Update: 27

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/12/2011
Date Data Arrived at EDR: 04/15/2011
Date Made Active in Reports: 05/18/2011
Number of Days to Update: 33

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Semi-Annually

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 03/29/2011
Date Data Arrived at EDR: 04/20/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 27

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 03/03/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

COLUSA COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 12/01/2010
Date Data Arrived at EDR: 04/20/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 27

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 03/03/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 03/10/2011
Date Data Arrived at EDR: 03/11/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 13

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Semi-Annually

EL DORADO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List

CUPA facility list.

Date of Government Version: 03/28/2011
Date Data Arrived at EDR: 05/13/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 33

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 03/28/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 04/15/2011
Date Data Arrived at EDR: 04/19/2011
Date Made Active in Reports: 05/12/2011
Number of Days to Update: 23

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 02/08/2011
Date Data Arrived at EDR: 03/03/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 21

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 06/30/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/03/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 21

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 06/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

KINGS COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 06/09/2011
Date Data Arrived at EDR: 06/09/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 29

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 03/28/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 06/09/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 6

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/25/2011
Date Data Arrived at EDR: 04/28/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 19

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/25/2011
Next Scheduled EDR Contact: 08/08/2011
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 05/24/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 02/09/2011
Date Data Arrived at EDR: 02/09/2011
Date Made Active in Reports: 03/04/2011
Number of Days to Update: 23

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/25/2011
Next Scheduled EDR Contact: 08/08/2011
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 02/03/2011
Date Data Arrived at EDR: 02/08/2011
Date Made Active in Reports: 03/03/2011
Number of Days to Update: 23

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/25/2011
Next Scheduled EDR Contact: 08/08/2011
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 04/18/2011
Date Data Arrived at EDR: 04/20/2011
Date Made Active in Reports: 05/18/2011
Number of Days to Update: 28

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 06/07/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 30

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 04/15/2011
Date Data Arrived at EDR: 04/26/2011
Date Made Active in Reports: 05/18/2011
Number of Days to Update: 22

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 07/11/2011
Next Scheduled EDR Contact: 10/24/2011
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/06/2011
Date Data Arrived at EDR: 06/06/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 9

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing

CUPA Program listing from the Environmental Health Division.

Date of Government Version: 01/20/2011
Date Data Arrived at EDR: 03/03/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 21

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination

A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 07/09/2008
Date Data Arrived at EDR: 07/09/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 22

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/07/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites

Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 06/06/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: No Update Planned

ORANGE COUNTY:

List of Industrial Site Cleanups

Petroleum and non-petroleum spills.

Date of Government Version: 05/02/2011
Date Data Arrived at EDR: 05/20/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 26

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups

Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/05/2011
Date Data Arrived at EDR: 05/20/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 26

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities

Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 05/05/2011
Date Data Arrived at EDR: 05/17/2011
Date Made Active in Reports: 06/20/2011
Number of Days to Update: 34

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/17/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities

List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/20/2011
Date Data Arrived at EDR: 06/21/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 17

Source: Placer County Health and Human Services
Telephone: 530-889-7312
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/26/2011
Date Data Arrived at EDR: 04/28/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 19

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Quarterly

Underground Storage Tank Tank List

Underground storage tank sites located in Riverside county.

Date of Government Version: 04/26/2011
Date Data Arrived at EDR: 04/28/2011
Date Made Active in Reports: 05/18/2011
Number of Days to Update: 20

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/07/2011
Date Data Arrived at EDR: 04/28/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 19

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 10/24/2011
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/07/2011
Date Data Arrived at EDR: 04/29/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 18

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 10/24/2011
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 06/09/2011
Date Data Arrived at EDR: 06/09/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 6

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/09/2010
Date Data Arrived at EDR: 09/15/2010
Date Made Active in Reports: 09/29/2010
Number of Days to Update: 14

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 06/17/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/01/2010
Date Data Arrived at EDR: 11/16/2010
Date Made Active in Reports: 01/25/2011
Number of Days to Update: 70

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversight Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/16/2011
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST

A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/27/2011
Date Data Arrived at EDR: 06/29/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 9

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 05/31/2011
Date Data Arrived at EDR: 05/31/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 38

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 04/19/2011
Date Data Arrived at EDR: 04/20/2011
Date Made Active in Reports: 05/17/2011
Number of Days to Update: 27

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/21/2011
Date Data Arrived at EDR: 03/22/2011
Date Made Active in Reports: 04/20/2011
Number of Days to Update: 29

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing

CUPA Program Listing from the Environmental Health Services division.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 11/22/2010
Date Data Arrived at EDR: 03/03/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 21

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 06/29/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

SANTA CLARA COUNTY:

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county.
Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 05/29/2009
Date Data Arrived at EDR: 06/01/2009
Date Made Active in Reports: 06/15/2009
Number of Days to Update: 14

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 08/31/2009
Date Data Arrived at EDR: 08/31/2009
Date Made Active in Reports: 09/18/2009
Number of Days to Update: 18

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List

CUPA facility listing.

Date of Government Version: 05/31/2011
Date Data Arrived at EDR: 05/31/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 38

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 05/31/2011
Date Data Arrived at EDR: 05/31/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 38

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

SOLANO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/09/2011
Date Data Arrived at EDR: 06/29/2011
Date Made Active in Reports: 07/08/2011
Number of Days to Update: 9

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 03/21/2011
Date Data Arrived at EDR: 03/25/2011
Date Made Active in Reports: 04/22/2011
Number of Days to Update: 28

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/05/2011
Date Data Arrived at EDR: 04/06/2011
Date Made Active in Reports: 05/12/2011
Number of Days to Update: 36

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 03/14/2011
Date Data Arrived at EDR: 03/15/2011
Date Made Active in Reports: 03/24/2011
Number of Days to Update: 9

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 01/26/2011
Date Data Arrived at EDR: 02/25/2011
Date Made Active in Reports: 03/22/2011
Number of Days to Update: 25

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/24/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 04/01/2011
Date Data Arrived at EDR: 04/07/2011
Date Made Active in Reports: 05/12/2011
Number of Days to Update: 35

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 10/24/2011
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/24/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 04/26/2011
Date Data Arrived at EDR: 05/03/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 43

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/01/2011
Date Data Arrived at EDR: 03/23/2011
Date Made Active in Reports: 04/22/2011
Number of Days to Update: 30

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/21/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 04/26/2011
Date Data Arrived at EDR: 05/03/2011
Date Made Active in Reports: 06/20/2011
Number of Days to Update: 48

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 10/24/2011
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 05/12/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 34

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 04/04/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 08/26/2009
Date Made Active in Reports: 09/11/2009
Number of Days to Update: 16

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/26/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 07/22/2010
Date Made Active in Reports: 08/26/2010
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/19/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 05/12/2011
Date Made Active in Reports: 05/24/2011
Number of Days to Update: 12

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/12/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 12/14/2009
Number of Days to Update: 13

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/04/2011
Next Scheduled EDR Contact: 07/06/2011
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 06/24/2011
Date Made Active in Reports: 06/30/2011
Number of Days to Update: 6

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 07/06/2010
Date Made Active in Reports: 07/26/2010
Number of Days to Update: 20

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities

Source: Department of Social Services

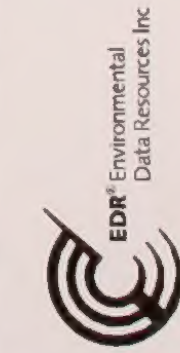
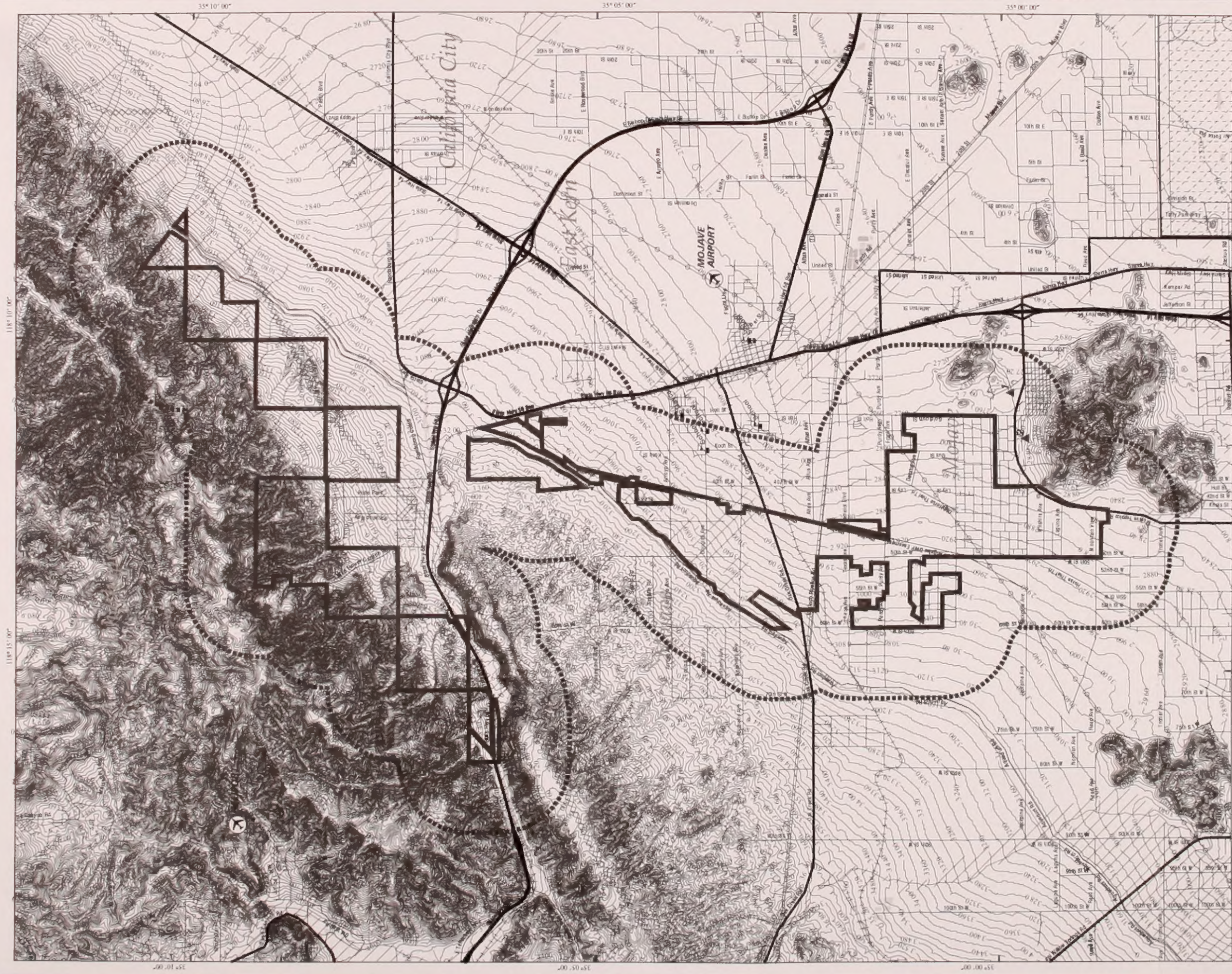
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

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EDR DataMap® - Area Study

Alta Infill II



Mojave, CA

- | | | | | |
|--|--|---|---|---|
| <ul style="list-style-type: none"> Listed Sites Earthquake Epicenters (Richter 5 or greater) Search Boundary Roads | <ul style="list-style-type: none"> Major Roads Waterways Railroads Contour Lines | <ul style="list-style-type: none"> Pipelines Powerlines Fault Lines Water | <ul style="list-style-type: none"> Superfund Sites Federal DOD Sites Indian Reservations BIA 100-Yr Flood Zones | <ul style="list-style-type: none"> National Wetland Inventory |
|--|--|---|---|---|



Scale in Miles

Appendix M

Economic and Fiscal Impacts of the Alta Wind Energy Center

October 20, 2011

John D. Latham, Ph.D., Director
Michael J. Lee, Research Analyst
Ariel H. Hersh, Research Analyst

Prepared for

Alta Wind Energy Center, LLC

The Brattle Group

Economic and Fiscal Impacts of the Alta Wind Energy Center

October 20, 2011

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Kyle Hubbard, Research Analyst

Prepared for

Alta Windpower Development, LLC

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EXECUTIVE SUMMARY

This report presents the actual and expected economic and fiscal impacts of the Alta Wind Energy Center (AWEC), a series of projects that together comprise 1,548 megawatts (MW) of wind energy facilities currently under development by Alta Windpower Development (AWD), LLC in Kern County ("County"). These projects' equipment, materials, labor and development costs are expected to total \$2.8 billion over the entire construction phase (2010-2012). Annual operating costs once the projects are complete will be \$381 million (including taxes, financing and lease payments). Approximately \$231 million of the construction cost and \$55 million of the annual operating cost are projected to be spent in the County. At the state-level, an estimated \$387 million will be spent during the construction phases and an estimated \$66 million per year will be spent during the operating phases.

As shown by Table E1 this spending results in substantial jobs in Kern County and elsewhere in California. Just over 2,400 direct, indirect and induced jobs in the County can be attributed to AWEC during construction and just over 700 jobs during plant operations. Total statewide jobs total over 4,300 during construction and about 990 during operations. *Direct impacts* reflect the initial change in economic activity from local payroll and construction expenditures over the construction and operating periods. The *indirect impact* results from local "business-to-business" transactions necessary to support the direct activity, for instance local purchase of building materials and engineering and consulting services. The *induced impacts* result when the increased earnings generated by the direct and indirect economic activity are spent on local goods and services, for example when workers at the facility purchase food and healthcare.

Table E1. Total FTE Employment Impacts of Alta Wind Energy Center

	Construction Period (Total FTE Jobs)		Operating Period (FTE Jobs Per Year)	
	Kern County	California	Kern County	California
Direct	655	655	156	156
Indirect	1,318	2,428	439	582
Induced	431	1,248	123	251
Total	2,404	4,331	718	989

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Full-time equivalent (FTE) employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

Certain materials and equipment, such as the transformer, turbines, blades and towers, are assumed to be imported from outside California and therefore not included in the impacts shown above.

In addition to creating both temporary and long term employment, AWEC will generate substantial property and sales tax revenues to Kern County, the city of Tehachapi, and California. AWEC will pay at least \$31 million in annual property taxes. Sales tax payments will total \$178 million by the time AWEC is fully operational. At the same time, the project will not create financial burdens on government services or infrastructure.

AWEC also makes an important contribution to California's renewable energy goal. In the absence of this project, meeting the goal would require greater imports of renewables from outside California resulting in higher energy generation costs. The amount of carbon emissions avoided by this project annually is equivalent to the emissions of over 590,000 automobiles.

According to the Energy Information Administration (EIA) the average American household consumes approximately 11,000 kWh of electricity per year. Given that AVEC is expected to generate a minimum of 4,376 GWh per year this is equal to supplying approximately 400,000 households with electricity.¹

As shown by Table 13 the spending results in substantial jobs in the County. The County will receive over 2,400 direct jobs and 1,000 indirect jobs in the County over the life of the project. During construction and just over 300 jobs during plant operation. Total employment will be over 4,300 during construction and about 900 during operation. These figures represent the total change in economic activity from total payroll and construction expenditures over the construction and operating periods. The indirect impact on the local economy, through the "multiplier" effect, is expected to support the direct activity. For instance, if the County is building materials and engineering and other services. The indirect impact could be the increased earnings generated by the direct and indirect economic activity and spent on local goods and services. For example, when workers at the facility purchase food and housing.

Table 13: Total EIA Employment Projections for the AVEC Project

Category	Construction (Jobs)	Operation (Jobs)	Total (Jobs)
Direct	2,400	300	2,700
Indirect	1,000	100	1,100
Total	3,400	400	3,800

¹ Energy Information Administration: in 2009, the average annual electricity consumption for a U.S. residential utility customer was 10,896 kWh. <http://205.254.135.24/tools/faqs/faq.cfm?id=97&t=3>
Accordingly (4,375,500,000 kWh divided by 10,896 kWh is equal to 401,569 households per year)

I. INTRODUCTION

The projects that comprise the Alta Wind Energy Center (AWEC) have been in development in Kern County California for the last several years. When it is completed in 2012, it will have a capacity of 1,548 MW making it one of the largest wind generation facilities in the U.S.² AWEC makes substantial contribution toward the state of California's renewable energy goal. Electricity generated by the plant is distributed by Southern California Edison to consumers primarily located in southern California via the Tehachapi Renewable Transmission Project.³

II. METHODOLOGY

This economic analysis relies on IMPLAN (Impact analysis for Planning), an input-output model developed and maintained by the Minnesota IMPLAN Group ("MIG") that is used for economic impact analysis by over 2,000 public and private institutions including many in California.⁴ The analysis draws on data collected from numerous state and federal sources, including the Bureau of Economic Analysis, Bureau of Labor Statistics (BLS), and the U.S. Census Bureau.

a. Description of IMPLAN

The IMPLAN modeling system relies on a matrix representation of the economy that describes the relationships among industries, consumers, government and foreign suppliers in order to derive the economy-wide impacts of changes in a specific industry. This matrix representation is the so-called Leontief matrix, which contains average input (purchase) coefficients that describe the mix of goods, services and labor that are required to produce a unit of output; that is, how the output of one industry is used as an input in other related industries. The resulting input-output coefficients represent what economists refer to as production functions.⁵ The basic input-output model can be expressed in a straightforward equation: $X = (I - A)^{-1} * dY$ where $(I - A)$ is the inverse of the Leontief matrix, dY is a change in final demand and X is output.

The IMPLAN model refines the US economy into 440 unique sectors and allows for regional disaggregation down to the county level. The model can be used to estimate the direct, indirect and induced impacts on employment, earnings and output as a result of final demand changes that result from a new investment in a particular industry or compilation of industries.⁶ The *direct effect* captures the initial change in economic activity resulting from the new investment. The *indirect effect* reflects new economic activity that is stimulated by the direct investment in

² Terra-Gen Power, Alta Wind Energy Center Fact Sheet, no date.

³ Southern California Edison, Tehachapi Renewable Transmission Project, Fact Sheet, July 2007. www.sce.com

⁴ Minnesota IMPLAN Group. IMPLAN Version 3. www.implan.com.

⁵ The production functions used in IMPLAN are based on the U.S. Bureau of Economic Analysis' (BEA's) Benchmark Input-Output Accounts.

⁶ *Final Demand* is the demand of units external to the industrial sectors that constitute the producers in the economy, e.g., households, government and foreign trade. (Miller and Blair, 1985). Output represents the value of industry production.

industries that supply inputs to the sector of initial change. For example, increased spending on engineering consulting services to support the construction industry would be an indirect effect that arises during the construction phase of the plant. The *induced effect* captures the economic activity that results when the increased earnings generated by the direct and indirect economic activity is spent on local goods and services, for instance when construction workers hired to build the plant spend income on groceries, clothing, financial services, real estate, and healthcare. The economic impact of the project is the sum of these direct, indirect and induced effects.

b. IMPLAN Inputs

The county-level and state-level employment impacts of the 1,548 MW Alta Wind Energy Center are estimated using IMPLAN version 3. The National Renewable Energy Laboratory's (NREL's) Jobs and Economic Development Impact (JEDI) model for wind power generation projects provided guidance as to the breakdown of components that comprise a wind energy system.⁷ Consistent with JEDI, the on-site workforce, or direct FTE employment, for both the construction and operating period was estimated using labor cost and wage information provided by AWD. The local share of spending both in-state and in Kern County was estimated using data from AWD and JEDI default data.

The economic impact analysis considers the effect of construction and O&M spending both statewide and on the local economy comprised Kern County. The construction and O&M period inputs used to estimate the employment impacts are summarized in Tables 2.1 and 2.2. AWEC's equipment, materials, labor and development costs are expected to total \$2.8 billion over the entire construction phase (2010-2012) Annual operating costs once the projects are complete will be \$381 million (including taxes, financing and lease payments). Approximately \$231 million of the construction cost and \$55 million of the annual operating cost are projected to be spent in the County. At the state-level, an estimated \$387 million will be spent during the construction phases and an estimated \$66 million per year will be spent during the operating phases.

Table 2.1 Construction Period Cost Breakdown for Alta Wind Energy Center (2010 \$)

	Materials & Equipment		Labor, Development & Other		Total
Spending in Kern County	\$	89,777,338	\$	141,146,672	\$ 230,924,009
Spending in CA	\$	161,996,527	\$	224,570,506	\$ 386,567,033
Total Spending	\$	2,311,121,981	\$	515,592,811	\$ 2,826,714,791

Source: AWD

⁷ National Renewable Energy Laboratory. JEDI Photovoltaic Model PV1.10.03. 2010.
<http://www.nrel.gov/analysis/jedi/download.html>.

Table 2.2 Operating Period Cost Breakdown for Alta Wind Energy Center (2010 \$ Per Year)

	Materials & Services		Labor, Financing & Other		Total
Spending in Kern County	\$	11,266,727	\$	43,381,859	\$ 54,648,586
Spending in CA	\$	22,769,573	\$	43,381,859	\$ 66,151,432
Total Spending	\$	29,285,711	\$	351,441,302	\$ 380,727,013

Source: AWD

Notes:

Total Spending includes the value of the land lease and equity payments. These costs were omitted in estimating the CA County and CA employment impacts.

III. EMPLOYMENT IMPACTS

The results of modeling the inputs described in Tables 2.1 and 2.2 in IMPLAN are displayed in Tables 3.1 - 3.6. Tables 3.1 and 3.2, respectively, show the construction period employment impacts of the Alta Wind Energy Center in Kern County and California as a whole.⁸ These impacts are broken out into three classifications: “Operational” or the 720 MW that was constructed in 2010, “Under Construction” or the 300 MW that will be constructed and completed in 2011, and “Under Development” or the 528 MW that will be constructed and completed in 2012. AVEC is expected to generate 2,404 direct, indirect and induced full-time equivalent jobs over the construction periods in Kern County and 4,331 jobs statewide. These numbers include 655 in on-site labor impacts.⁹

Table 3.1 Construction Period FTE Employment Impacts of Alta Wind Energy Center
Kern County (FTE Jobs)

	Operational (Completed in 2010)	Under Construction (To Be Completed in 2011)	Under Development (To Be Completed in 2012)	Total
Direct	305	127	223	655
Indirect	613	255	450	1,318
Induced	200	84	147	431
Total	1,118	466	820	2,404

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Full-time equivalent (FTE) employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

⁸ Employment impacts for Palmdale and Lancaster could not be estimated separately and are included in the Kern County numbers.

⁹ Construction jobs provided by the Tehachapi Renewable Transmission Project that links the Alta Wind Energy Center to the grid are not included in these estimates.

Table 3.2 Construction Period FTE Employment Impacts of Alta Wind Energy Center
California - Statewide (FTE Jobs)

	Operational (Completed in 2010)	Under Construction (To Be Completed in 2011)	Under Development (To Be Completed in 2012)	Total
Direct	305	127	223	655
Indirect	1,129	471	828	2,428
Induced	580	242	426	1,248
Total	2,014	839	1,477	4,331

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Full-time equivalent (FTE) employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

Tables 3.3 and 3.4 show the number of jobs estimated in Kern County and the state overall when the three phases of AWEC become operational. Note that these are annual numbers. AWEC is expected to provide 718 jobs per year in the County and 989 jobs per year statewide during the operating phases. Of this, 156 jobs will belong to employees directly involved in operating the facility.

Table 3.3 Operating Period FTE Employment Impacts of Alta Wind Energy Center
Kern County (FTE Jobs Per Year)

	Operational (Completed in 2010)	Under Construction (To Be Completed in 2011)	Under Development (To Be Completed in 2012)	Total
Direct	73	30	53	156
Indirect	204	85	150	439
Induced	57	24	42	123
Total	334	139	245	718

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Full-time equivalent (FTE) employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

Table 3.4 Operating Period FTE Employment Impacts of Alta Wind Energy Center
California - Statewide (FTE Jobs Per Year)

	Operational (Completed in 2010)	Under Construction (To Be Completed in 2011)	Under Development (To Be Completed in 2012)	Total
Direct	73	30	53	156
Indirect	271	113	199	582
Induced	117	49	86	251
Total	460	192	337	989

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Full-time equivalent (FTE) employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

Table 3.5 shows the breakdown of statewide job creation by IMPLAN sector. Most of the employment impacts are the result of direct and induced spending, with a substantial number of jobs occurring in the construction, real estate, and professional services sectors, as well as sectors supported by households spending their income on food and healthcare.

Table 3.5 Construction Period FTE Employment Impacts by IMPLAN Sector - Statewide
Top Ten IMPLAN Sectors in Terms of Total Employment Creation

IMPLAN	IMPLAN Description	FTE Jobs
36	Construction of other new nonresidential structures	1,642
360	Real estate establishments	280
369	Architectural, engineering, and related services	206
330	Retail Stores - Miscellaneous	141
413	Food services and drinking places	138
319	Wholesale trade businesses	107
335	Transport by truck	78
382	Employment services	77
380	All other miscellaneous professional, scientific, and technical services	68
394	Offices of physicians, dentists, and other health practitioners	66

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

FTE Jobs includes direct, indirect and induced employment.

Figures 3.1 and 3.2 present a breakdown of construction period employment by sector in California and Kern County, respectively.¹⁰ As is evident from the figures, project spending in the construction industry drives the bulk of job creation in both California and Kern County. Note that the employment impacts in California are inclusive of the Kern County impacts.

¹⁰ Note these figures are not necessarily indicative of the sectors where jobs are created, but rather the sectors of initial spending that are driving overall job creation.

Figure 3.1 Construction Period FTE Job Creation by Sector of Spending - California

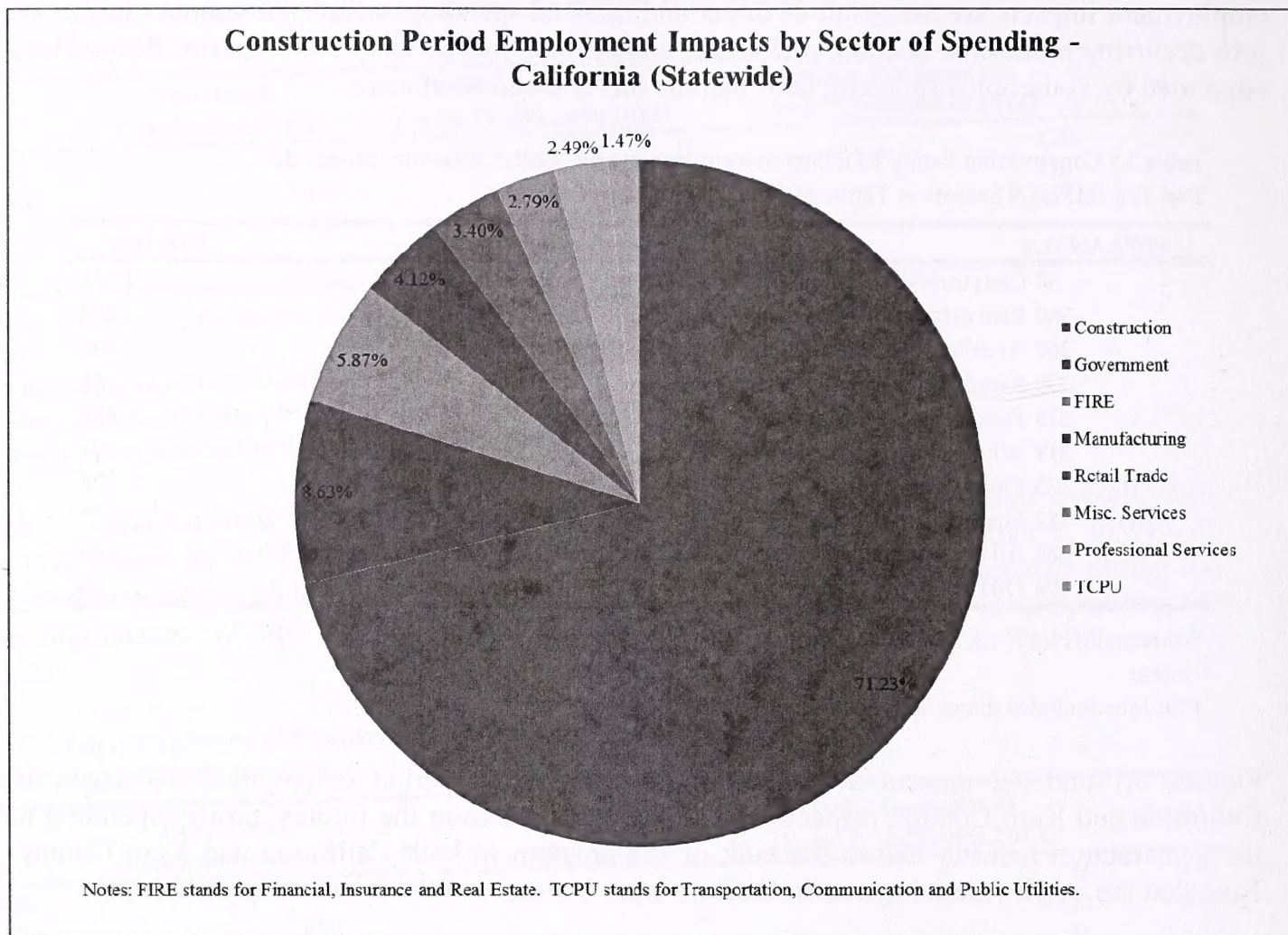
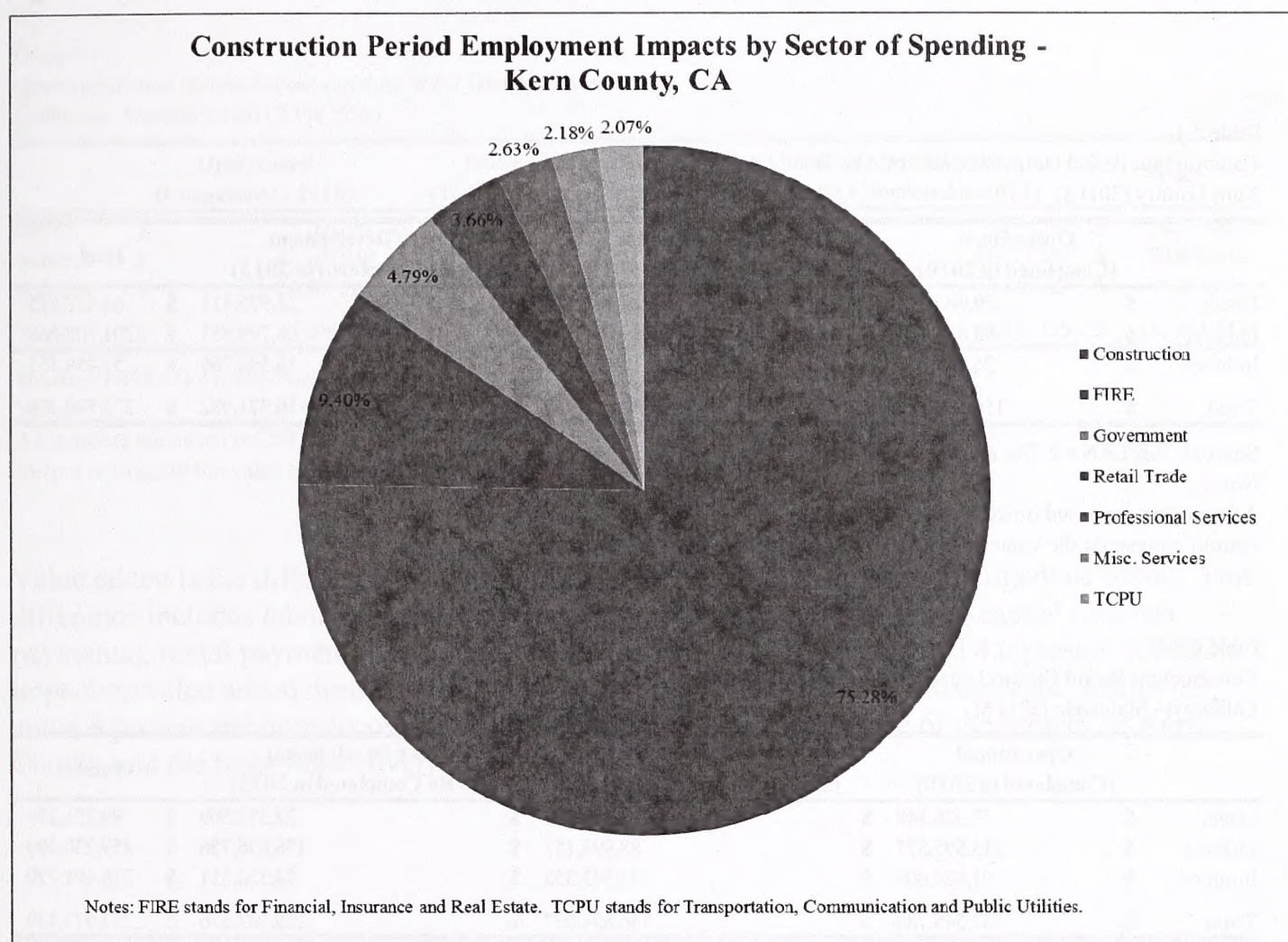


Figure 3.2 Construction Period FTE Job Creation by Sector of Spending – Kern County



IV. OTHER ECONOMIC IMPACTS

AWEC, in addition to its employment impacts, has created substantial economic activity in Kern County and the State. This activity is typically measured as changes to output and value added. Output represents total industrial output and value added represents difference between industrial output and the costs of intermediate inputs. Gross output captures economic activity by counting all transactions for all goods and services by all industries. Tables 4.1 and 4.2 present AWEC's impact on gross output in Kern County and California during the construction phase of the project. Tables 4.3 and 4.4 show the impacts on gross output during the operating phase on the County and the State respectively.

Table 4.1

Construction Period Output Impacts of Alta Wind Energy Center
Kern County (2011 \$)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	29,966,333	\$	12,485,972	\$	21,975,311	\$ 64,427,615
Indirect	\$	93,817,984	\$	39,090,827	\$	68,799,855	\$ 201,708,666
Induced	\$	26,722,863	\$	11,134,526	\$	19,596,766	\$ 57,454,155
Total	\$	150,507,179	\$	62,711,325	\$	110,371,932	\$ 323,590,436

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Output represents the value of industry production.

Table 4.2

Construction Period Output Impacts of Alta Wind Energy Center
California - Statewide (2011 \$)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	37,326,148	\$	15,552,562	\$	27,372,509	\$ 80,251,219
Indirect	\$	213,595,577	\$	88,998,157	\$	156,636,756	\$ 459,230,490
Induced	\$	101,624,060	\$	42,343,358	\$	74,524,311	\$ 218,491,729
Total	\$	352,545,785	\$	146,894,077	\$	258,533,576	\$ 757,973,439

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Output represents the value of industry production.

Table 4.3

Operating Period Output Impacts of Alta Wind Energy Center
Kern County (2011 \$ Per Year)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	3,783,707	\$	1,576,545	\$	2,774,719	\$ 8,134,971
Indirect	\$	27,768,352	\$	11,570,147	\$	20,363,458	\$ 59,701,956
Induced	\$	7,651,967	\$	3,188,320	\$	5,611,443	\$ 16,451,730
Total	\$	39,204,027	\$	16,335,011	\$	28,749,619	\$ 84,288,657

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Output represents the value of industry production.

Table 4.4

Operating Period Output Impacts of Alta Wind Energy Center
California - Statewide (2011 \$ Per Year)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	3,786,201	\$	1,577,584	\$	2,776,547	\$ 8,140,332
Indirect	\$	42,309,959	\$	17,629,150	\$	31,027,303	\$ 90,966,412
Induced	\$	20,602,267	\$	8,584,278	\$	15,108,329	\$ 44,294,873
Total	\$	66,698,427	\$	27,791,011	\$	48,912,179	\$ 143,401,617

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Output represents the value of industry production.

Value added is the difference between industrial output and the costs of intermediate inputs. This difference includes labor payments, government services paid for by taxes, capital (interest payments), rental payments, and entrepreneurship (profits). Tables 4.5 and 4.6 present AWEC's impact on value added during the construction phase in Kern County and the state. Tables 4.7 and 4.8 present the impacts on value added during the operating phase of the project on Kern County and the State respectively.

Table 4.5

Construction Period Value Added Impacts of Alta Wind Energy Center
Kern County (2011 \$)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	14,932,694	\$	6,221,956	\$	10,950,643	\$ 32,105,293
Indirect	\$	54,372,912	\$	22,655,380	\$	39,873,469	\$ 116,901,761
Induced	\$	16,731,210	\$	6,971,338	\$	12,269,554	\$ 35,972,102
Total	\$	86,036,817	\$	35,848,674	\$	63,093,666	\$ 184,979,156

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Value added is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs.

Table 4.6

Construction Period Value Added Impacts of Alta Wind Energy Center
California - Statewide (2011 \$)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	18,898,247	\$	7,874,269	\$	13,858,714	\$ 40,631,231
Indirect	\$	113,163,668	\$	47,151,528	\$	82,986,690	\$ 243,301,885
Induced	\$	60,622,715	\$	25,259,465	\$	44,456,658	\$ 130,338,838
Total	\$	192,684,630	\$	80,285,262	\$	141,302,062	\$ 414,271,954

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Value added is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs.

Table 4.7

Operating Period Value Added Impacts of Alta Wind Energy Center
Kern County (2011 \$ Per Year)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	2,105,345	\$	877,227	\$	1,543,920	\$ 4,526,492
Indirect	\$	15,707,117	\$	6,544,632	\$	11,518,553	\$ 33,770,302
Induced	\$	4,790,151	\$	1,995,896	\$	3,512,778	\$ 10,298,825
Total	\$	22,602,613	\$	9,417,756	\$	16,575,250	\$ 48,595,619

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Value added is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs.

Table 4.8

Operating Period Value Added Impacts of Alta Wind Energy Center
California - Statewide (2011 \$ Per Year)

	Operational (Completed in 2010)		Under Construction (To Be Completed in 2011)		Under Development (To Be Completed in 2012)		Total
Direct	\$	2,125,680	\$	885,700	\$	1,558,832	\$ 4,570,211
Indirect	\$	23,333,740	\$	9,722,391	\$	17,111,409	\$ 50,167,540
Induced	\$	12,290,394	\$	5,120,997	\$	9,012,956	\$ 26,424,347
Total	\$	37,749,813	\$	15,729,089	\$	27,683,196	\$ 81,162,098

Sources: IMPLAN v3; *The Brattle Group* 2011

Notes:

All numbers are based on 2011 dollars.

Value added is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs.

V. FISCAL IMPACTS

AWEC has become a major source of property and sales tax revenue to Kern County. AWD will pay at least \$31 million in County property taxes annually when the AWEC is completed in 2012. This is a substantial share of the County's property tax revenue.¹¹ As shown in Table 5.1 sales tax payments will total \$178 million by the time the entire project is complete. The State's share will be \$155 million, and the County share will be \$23 million. As shown in Table 5.2, when all three phases of AWEC are fully operational annual sales tax payments will total \$2.3 million. This will include payments of about \$2 million to the State and \$293,000 to Kern County each year.¹²

According to the Environmental Impact Reports currently prepared for the AWEC projects, the AWEC is not expected to result in significant demands on government services or infrastructure and moreover expected revenues will be sufficient to cover any such costs.¹³ In fact, the AWEC projects have contributed or will contribute to fire fighting services and other community services, such as schools, education programs, etc. For example, AWEC contractors have already provided assistance to local firefighters.¹⁴

Table 5.1 Sales Tax Resulting From Alta Wind Energy Center
Construction Period - (2011 \$ million)

Phase	State Share	County Share	Total Sales Tax
Operational	77.93	10.75	88.68
Under Construction	27.99	4.48	32.47
Under Development	49.27	7.88	57.15
<i>Total</i>	<i>155.19</i>	<i>23.11</i>	<i>178.31</i>

Source: AWD

Table 5.2 Sales Tax Resulting From Alta Wind Energy Center
Operating Period - (2011 \$ thousand per year)

Phase	State Share	County Share	Total Sales Tax
Operational	987.54	136.21	1,123.75
Under Construction	354.72	56.76	411.48
Under Development	624.31	99.89	724.20
<i>Total</i>	<i>1,966.57</i>	<i>292.86</i>	<i>2,259.43</i>

Source: AWD

¹¹ Kern County's Recommended Budget for Fiscal Year 2011-2012 anticipate about \$244 million in property tax Recommended Budget, June 14, 2011.

¹² This is based on a total sales tax rate of 8.5% (7.25% state, .75 Kern County, and .25 Tehachapi). The County sales tax revenue allocation includes Tehachapi revenues in the figures presented above.

¹³ Environmental Impact Review, Alta-Oak Creek Mojave Project and Supplemental Environmental Impact Review Alta Infill Project.

¹⁴ Mark Powell, "Wind workers help firefighters," Tehachapi News, Monday August 23, 2010 www.Tehachapinews.com/special_sections/west_fire/x346497838/wind-workers accessed September 27, 2011.

VI. ENERGY AND GREENHOUSE GAS IMPACTS

California law currently requires that 33% of the State's electricity demands be met with renewable energy by 2020. The AWEC projects are intended to help meet this target. The California Public Utility Commission created the 33% RPS Calculator to determine how this target. It can also be used to determine how the target will be met if specific wind energy projects are canceled.¹⁵ The RPS Calculator is a Microsoft Excel spreadsheet model constructed by Energy and Environmental Economics Inc. (E3) for the CPUC. The model was developed to aggregate the renewable cost and performance data and select renewable resources needed to meet the RPS target.¹⁶ The model identifies transmission investments that deliver renewable resources to load and conventional resources that are needed to meet energy and peak demand growth. It also calculates the cost and GHG impacts of a given portfolio of resources in 2020. E3 also calculated the renewable resource need to determine how much renewable energy the state needs to procure between now and 2020 to meet the 33% RPS.

According to the 33% RPS Calculator, the absence of the AWEC projects would result in higher out of state and country imports of renewable energy. The 1548 MW is expected to generate a minimum of 4,376 GWh accounting for 50% of all available renewable generation capacity in the Tehachapi area. The loss of this generation would result in a transfer of renewable generation into Baja, Mexico¹⁷. That generation loss from curtailment would result in a commensurate reduction in the state's ability to meet the 33% RPS goal. Furthermore, the necessary imported energy would result in increased cost of delivered electricity. The cost of this electricity will increase from \$107.78/MWh to \$120.71/MWh. Total energy costs are expected to increase by \$57 million annually.

The AWEC projects will contribute to the reduction in greenhouse gas emissions from electricity production. The magnitude of the contribution can be calculated using EPA's "Green Power Equivalency Calculator" which produces a CO₂ offset factor for renewable generation. Base load generation is defined as a power plant that is under continuous operation. Non-base load generation is any power plant that is brought online as necessary to meet demand. The offset factor assumes that base load generation will not be reduced as a result of using renewable generation. The non-base load emission offset factor is an average mix of any type of electricity used to meet peak demand. It is conceivable that non-base load electricity generation could be used to supplement the loss of the AWEC. The CO₂ saved from using wind energy instead of non-base load electricity generation is approximately 3 million metric tons per year.¹⁸ For

¹⁵ <http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm>

¹⁶ For a more detailed discussion of the model, see the appendix.

¹⁷ The 33% RPS calculator optimizes the available renewable energy resources based on various factors (see Appendix A for a detailed discussion). The resulting mix of renewables is implemented in a piecewise increase of necessary generation from the next best project. Assuming all things are equal in the model (i.e. removing generation in Tehachapi will result in a direct substitution of the next highest ranked project) the resulting capacity replacement would come from Baja, Mexico.

¹⁸ The basis for the CO₂ calculation is from the EPA Green Power Equivalency Calculator Methodologies. The calculator can be found here <http://www.epa.gov/greenpower/pubs/calcmeth.htm#kilowatt>

The methodology assumes that renewable generation will not be offsetting base load generation such as coal and nuclear fuel sources. Our calculation is $(4,376,000,000 \text{ kWh} * 6.8956 \times 10^{-4} \text{ metric tons CO}_2 / \text{kWh})$ which results in 3,017,515 metric tons of CO₂ per year.

comparison purposes this is equivalent to removing approximately 590,000 vehicles from the road per year.¹⁹

According to the Energy Information Administration (EIA) the average American household consumes approximately 11,000 kWh of electricity per year. Given that AWEC is expected to generate a minimum of 4,376 GWh per year this is equal to supplying approximately 400,000 households with electricity.²⁰

¹⁹ The EPA calculator used above gives an approximate estimate of the metric tons of CO₂ per vehicle per year based on an average vehicle mile per gallon of 20.4 with the average vehicle miles traveled at 11,720 per year as a result the number of vehicles taken off the road can be estimated at (3,017,515 metric tons of CO₂/5.1 metric tons per vehicle per year) This is equivalent to 591,670 vehicles per year.

²⁰ Energy Information Administration: in 2009, the average annual electricity consumption for a U.S. residential utility customer was 10,896 kWh. <http://205.254.135.24/tools/faqs/faq.cfm?id=97&t=3>

Accordingly (4,375,500,000 kWh divided by 10,896 kWh is equal to 401,569 households per year)

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APPENDIX A: 33% RPS CALCULATOR

Staff at the CPUC developed the 33% Renewables Portfolio Standard (RPS) Implementation Analysis report, as part of the 2008 Long Term Procurement Planning in order to provide new, in-depth analysis on the cost, risk, and timing of meeting a 33% RPS. The report does not recommend a preferred strategy on how to reach a 33% by 2020 RPS, but rather provides an analytical framework for policymakers to weigh the tradeoffs inherent in any future 33% RPS program for California.

Working with a broad stakeholder group, including the investor-owned electrical utilities, industry experts, ratepayer advocates, and environmental groups, the study team, which consisted of CPUC staff and a consulting team, developed the preliminary results presented in this report. The report analyzes four different possible 33% RPS alternatives and articulates the costs and tradeoffs of each approach. The study team used the 33% RPS Reference Case to construct three illustrative timelines for achieving a 33% RPS. These timelines demonstrate how and when the state could plausibly build the necessary renewable generation and transmission to reach a 33% RPS.²¹

In order to conduct the analysis, E3 first created an RPS Calculator, which is a Microsoft Excel spreadsheet model developed to aggregate the renewable cost and performance data and select renewable resources needed to meet the RPS target. The model identifies transmission investments that deliver renewable resources to load and conventional resources that are needed to meet energy and peak demand growth. It also calculates the cost and GHG impacts of a given portfolio of resources in 2020. Second, E3 calculated the renewable resource need to determine how much renewable energy the state needs to procure between now and 2020 to meet the 33% RPS. E3 used the Energy Commission's 2007 IEPR load forecast to project statewide electricity load in 2020, which included assumptions on the state's achievement of energy efficiency, demand response, combined heat and power, and the California Solar Initiative.²²

The model generates plausible resource portfolios for serving California load in 2020 under 20% and 33% renewables requirements. According to the 33% RPS Calculator the ranking of resources used to meet the generation capacity necessary to meet the RPS target by 2020 is a combination of several factors. The ranking formula is outlined below.

Project Ranking Formula

- + Levelized cost of energy
- + Interconnection (gen-tie) costs
- + Deemed integration costs
- + Levelized, per-MWh incremental transmission costs
- Energy value
- Capacity value
- T&D avoided costs
- Adjustment for ED RPS Projects

²¹ <http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm>

²² 33% Renewables Portfolio Standard Implementation Analysis, CPUC. June 2009
<http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>

± Environmental score
= Final project rank

The reference case used in the report is the same as defined in the 33% RPS Implementation Analysis report. It is defined such that the utilities procure 75 TWh of additional renewables to meet a 33% RPS target by 2020. There is heavy emphasis on projects that are already either contracted or short-listed with California IOUs, which includes a significant proportion of solar thermal and solar photovoltaic resources.²³

We assume that the project rankings remain the same as the mix of available wind resources are constrained by curtailment regulations. The charts are a representation of the model output rankings for the quantity of generation and capacity as it is substituted between ranked resource zones.

Reference:

33% Renewables Portfolio Standard Implementation Analysis, CPUC. June 2009. P. 19.

<http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>

<http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm>

<http://www.cpuc.ca.gov/NR/rdonlyres/B3514A31-D7B1-422C-ADA7-10F94E387914/0/ResourceRankingandSelection.pdf>

Resource Ranking & Selection methodology for 33% Renewables Portfolio Standard Implementation Analysis. July 2009 Prepared for: CPUC Prepared by: Energy and Environmental Economics, Inc.

²³ 33% Renewables Portfolio Standard Implementation Analysis, CPUC. June 2009. P. 19

Appendix N

Geological Resources

Alta East Wind Project - Geological Resources

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DATE: September 9, 2010

1.0 Introduction

This technical memorandum describes the geologic and soil characteristics of the project site and the potential for impacts associated with the Alta East Wind Project (Alta East project, or the project). At the time of this evaluation, Alta Windpower Development, LLC (AWD) has identified three possible transmission line alternatives. AWD anticipates selecting one transmission alternative for detailed design and construction; final selection will occur in late 2010. Although AWD will select only one transmission route for the project, this analysis evaluates potential geologic impacts from all three transmission line alternatives.

A description of the environmental setting (affected environment) for geology and soils is presented below in Section 2.0, including discussion of the geologic setting (soils and geologic formations; faults and seismic history), and geologic and seismic hazards (slope stability; soil hazards; faults and seismicity; strong ground shaking; fault rupture; liquefaction). The regulatory setting applicable to geology and soils is presented in Section 3.0. The impact analysis, including discussion of project impacts and associated mitigation measures, is presented in Section 4.0.

2.0 Environmental Setting

The Alta East site is located in the Antelope Valley in Southern Kern County, near the town of Mojave, California. This area lies within the Mojave Desert geomorphic province. Terrain of the project site is mountainous in the west, and generally flat in the east, with a slight slope to the southeast. The project site is located within an area of southern California known to be seismically active.

2.1 Regional Geology

The project site straddles the desert floor and the foothills of the Tehachapi Mountains. Terrain of the area is mountainous in the west and generally flat in the east with a southeasterly slope. The Mojave Desert region is geologically young and seismically active. The geology of the region around the site is very complex, reflecting geologically rapid processes driven by active tectonics and rapid erosion primarily from the result of movement along the San Andreas and Garlock fault systems. Many active faults are present in the general area of the site (CGS, 2010).

2.2 Local Geology

The local geology of the site area includes alluvial material derived from erosion of the adjacent highlands and various bedrock types of the Tehachapi Mountains (LandAmerica Assessment Corporation [LAC], 2009). Generally, the site is composed of sand, gravel, and cobbles with very little to no fine-grained soils. Surficial geologic units are shown on Figure 1 and are described below.

The area is dominated by broad alluviated basins that are mostly aggraded surfaces receiving nonmarine continental deposits from adjacent uplands. Quaternary alluvium several thousand feet thick underlies the project area. Cretaceous quartz monzonite forms the basement of stratigraphic sequences in the Mojave Block in the vicinity of the project site. The quartz monzonite is overlain by Miocene-age volcanic rocks (LAC, 2009).

The geological units, based on Dibblee, 1967 and Smith, 1964, within the project area include the following:

- Alluvium: Alluvium of Late Pleistocene and Holocene age
- Older Quaternary Alluvium : Fanglomerates and terrace gravels often dissected and indurated. Finer grained facies including silt and sand. The detritus is almost exclusively of granitic origin.
- Quaternary Terrace Gravel: This is coarse grained, and of limited extent in the project area (impacting only transmission line Alternative B). Because of the limited geographic extent of this unit, for the purposes of this report it is considered equivalent to the Older Quaternary Alluvium.
- Horned Toad Formation: This geological unit is composed of about 1,000 feet of terrestrial sandstones and clays. It rests unconformably on granitic basement rocks and is restricted to the Horned Toad Hills northwest of Mojave.
- Older Tertiary Rhyolitic Felsite: An intrusive igneous unit of limited extent in the project area.
- Older Basement Rocks: These are granitic rocks and associated metamorphic suites, in this area restricted to gneissic rocks. There are no marble pendants associated with granitic rocks in the project vicinity as there are elsewhere.

2.3 Seismic Setting

There are several active faults within 50 miles of the project site. These include the Garlock Fault (West) that extends through the northwest portion of the site; the White Wolf Fault (25 miles to the west); the San Andreas Fault (33 miles to the west); the Pleito Thrust Fault (37 miles to west); and the San Gabriel Fault (46 miles to the southwest) (Jennings, 1994). The northwestern part of the proposed project site is located within the Garlock Fault Alquist-Priolo Special Study Zone.

These faults have had Holocene activity (within the last 10,000 years) and produced notable earthquakes including the 1857 Fort Tejon magnitude 8.2+ earthquake along the San Andreas Fault and the 1952 Arvin/Tehachapi magnitude 7.7 earthquake on the White Wolf Fault.



Legend

- Project Area
- Two-Mile Buffer

Proposed Transmission Line Alternatives

- Transmission Line Alternative A
- Transmission Line Alternative B
- Transmission Line Alternative C

Surficial Geology

- Qa - Alluvium
- Qoa - Older Alluvium
- Qot - Terrace Gravel
- Th - Horned Toad Formation
- Tr - Rhyolitic Felsite
- bc - Bean Canyon Formation
- gn - Gneissic Rocks
- qm - Quartz Monzonite

Notes:

- Qa - Undissected unconsolidated gravel, sand, and silt.
- bc - Marble, hornfels, schist, phyllite, and quartzite.
- gn - Quartz diorite gneiss and gneissoid quarta diorite, some biotite schist, and micaceous quartzite.
- Qoa - Dissected slightly consolidated alluvial sediments: fanglomerate, gravel, sand, silt, and clay, mostly of granite detritus.
- Qot - Terrace gravel
- Th - Gray clay shale, white marl, buff sandatone, raddish siltstone, and basal granitic conglomerate. Age, middle Pliocene (Hemphillian).
- Tr - Intrusive into Kinnick and older formations

Source:

Geologic Map of California. Bakersfield Sheet.
1:250,000 scale. Division of Mines and Geology. 1964

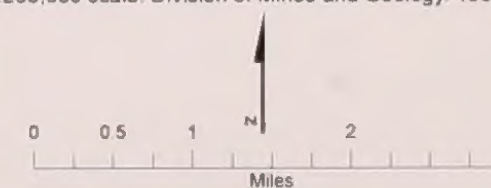


FIGURE 1
Surficial Geology

Alta East Wind Project
Alta Wind Energy Center Project

The two major faults located in the vicinity of the proposed project area are the Garlock and San Andreas Faults:

- **Garlock Fault.** This is a major structural break trending east-northeast from its intersection with the San Andreas Fault approximately 23 miles west of the proposed project site. From its intersection with the San Andreas Fault, the Garlock Fault zone extends about 260 kilometers toward Death Valley. The western segment of the Garlock Fault is located along the southern perimeter of the Tehachapi Mountains. In this segment, stream channels have been displaced by left slip movement. The western portion of the proposed project site is located within the boundaries of an Alquist-Priolo Special Study Zone (California Fault Zone) related to the Garlock Fault. The north branch of the Garlock Fault is considered an active fault, and is a high-angle shear zone with predominant strike slip movement to the west. In the region of the proposed project site, the displacement is unknown, although it is likely to be great (Dibblee, 1967; SEI, 2008).
- **San Andreas Fault.** In general, this high-angle fault trends northwest and was formed and active in Pleistocene time. Many related faults, including the Tylerhorse Fault (3.5 miles southwest of the proposed project site) and the Cottonwood Fault (5.0 miles southwest of the proposed project site), off-set alluvial deposits and are active or potentially active. Several of the regionally related faults, including the Galway Lake and Homestead Valley Faults, have caused earthquakes and ground ruptures (right slip) in 1975 and 1979, respectively. All of these faults are considered part of the San Andreas Fault system. It has not been possible thus far to determine the nature and amount of fault displacement; however, Holocene age movement has been shown on many of these northwesterly trending faults as observed by displacement in alluvial fans and offset lines of drainage (SEI, 2008).

Numerous historic earthquakes have affected the Mojave Desert region where the proposed project site is located. Table 4.6-1 below (reprinted from the *Limited Feasibility Level Geological and Geotechnical Evaluation for the Proposed Alta-Oak Creek Mojave Project* [SEI, 2008]) provides a summary of major known seismic events.

Table 4.6-1. Historic Seismic Events in the Proposed Project Area				
Date	Name	Fault	Magnitude	Notes
01/09/1857	Fort Tejon Earthquake	San Andreas Fault	8.2+	30 feet of slippage over a 200-mile area, widespread damage
07/21/1952	Arvin/Tehachapi Earthquake	White Wolf Fault	7.7	Extensive damage to buildings and highways
08/22/1952	Bakersfield Earthquake (aftershock of Arvin/Tehachapi)	White Wolf Fault, 6 miles ESE of Bakersfield	5.8	Extensive damage to already-weakened structures and multiple surface fissures

Source: SEI, 2008

The majority of recent seismic activity in the vicinity of the proposed project site has occurred along the White Wolf Fault and the San Andreas Fault. Historic earthquakes along the Garlock Fault, adjacent to the proposed project site, have not occurred within the last 200 years (SEI, 2008).

3.0 Regulatory Setting

Geologic resources and geotechnical hazards are governed primarily by local jurisdictions. The conservation elements and seismic safety elements of city and county general plans contain policies for the protection of geologic features and avoidance of hazards. In addition, the project proponent must comply with other applicable State of California and local applicable statutes, regulations and policies. Relevant and potentially relevant statutes, regulations and policies are discussed below.

3.1 State of California

The Alquist-Priolo Earthquake Fault Zoning Act of 1972

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. In accordance with this law, the California Geological Survey maps active faults and designates Earthquake Fault Zones along mapped faults. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geologic explorations in order to determine whether building setbacks should be established. Any project that involves the construction of buildings or structures for human occupancy, such as an operation and maintenance building, is subject to review under the Alquist-Priolo Earthquake Fault Zoning Act, and any structures for human occupancy must be located at least 50 feet from any active fault.

The Seismic Hazards Mapping Act of 1990

In accordance with Public Resources Code, Chapter 7.8, Division 2, the California Department of Conservation, Division of Mines and Geology (now the California Geological Survey [CGS]) is directed to delineate Seismic Hazard Zones. The purpose of this Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards, such as those associated with strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. In accordance with the Seismic Hazards Mapping Act, site-specific geotechnical investigations must be performed prior to permitting most urban development projects within seismic hazard zones.

The California Building Code (California Building Standards Commission [CBSC], 2007)

The State of California provides minimum standards for building design through the California Building Code (CBC). The CBC is based on the Uniform Building Code (UBC), which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis), and has been modified for conditions within California. In January 2008, the revised 2007 version of the CBC took effect. In accordance with the CBC, a grading permit is required if more than 50 cubic yards of soil is moved during implementation of a proposed project. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

3.2 Kern County

Construction and operation of the proposed project is subject to policies and regulations contained within General and Specific Plans including the Kern County General Plan (County of Kern, 2007), Mojave Specific Plan (County of Kern, 2003), the Kern County Zoning Ordinance, and the Kern County Code of Building Regulations, which include policies for the avoidance of geologic hazards and/or the protection of unique geologic features, as well as for the preservation of paleontologic resources. The policies, goals, and implementation measures in the Kern County General Plan for geology and soils applicable to the project are provided below. The Kern County General Plan contains additional policies, goals, and implementation measures that are more general in nature and are not specific to development such as the proposed project.

Kern County General Plan (County of Kern, 2007)

Section 1.3 Physical and Environmental Constraints

- **Policy 1.** Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained (Map Code 2.1 [Seismic Hazard], Map Code 2.2 [Landslide], Map Code 2.3 [Shallow Groundwater], Map Code 2.5 [Flood Hazard], Map Codes from 2.6 - 2.9, Map Code 2.10 [Nearby Waste Facility], and Map Code 2.11 [Burn Dump Hazard]) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.
- **Policy 6.** Regardless of percentage of slope, development on hillsides will be sited in the least obtrusive fashion, thereby minimizing the extent of topographic alteration required and reducing soil erosion while maintaining soil stability.
- **Policy 7.** Ensure that effective slope stability, wastewater drainage, and sewage treatment in areas with steep slopes are adequate for development.

Section 1.9 Resource (Land Use, Open Space, and Conservation Element)

- **Policy 17.** Lands classified as MRZ-2, as designated by the State of California, should be protected from encroachment of incompatible land uses.

Section 4.3 Seismically Induced Surface Rupture, Ground Shaking, and Ground Failure (Safety Element)

- **Policy 1.** The County shall require development for human occupancy to be placed in a location away from an active earthquake fault in order to minimize safety concerns.

Section 4.5 Landslides, Subsidence, Seiche, and Liquefaction (Safety Element)

- **Policy 1.** Determine the liquefaction potential at sites in areas of shallow groundwater (Map Code 2.3) prior to discretionary development and determine specific mitigation to be incorporated into the foundation design, as necessary, to prevent or reduce damage from liquefaction in an earthquake.
- **Policy 2.** Route major lifeline installations around potential areas of liquefaction or otherwise protect them against significant damage from liquefaction in an earthquake.

- **Policy 3.** Reduce potential for exposure of residential, commercial, and industrial development to hazards of landslide, land subsidence, liquefaction, and erosion.

Section 5 Energy Element

- **Policy 2.** All wind energy development shall be subject to the development standards of Kern County Zoning Ordinance.

Mojave Specific Plan (County of Kern, 2003)

Section I - Land Use Element

- **Goal.** Kern County will not permit new developments to be sited on land which is environmentally unsound to support such development.
- **Objective 3.5.** Protect the public from natural hazards including flooding and earthquakes.
- **Policy 3.5.1.** Proposed projects within the seismic hazard overlay shall meet all requirements of the Kern County Building Code.
- **Policy 3.5.2.** Proposed residential and commercial projects within the seismic hazard, steep slope or landslide overlay should be encouraged to develop using the cluster option.

Section V - Conservation

- **Goal 1.** Conserve known areas of mineral resources by limiting encroachment of incompatible urban uses.

Section IX - Seismic Safety Element

- **Goal 1.** Protect structures from potential damage caused by earthquakes.
- **Goal 2.** Promote awareness of potential flood and geologic hazards.

Kern County Zoning Ordinance (Title 19 of the Ordinance Code of Kern County)

Chapter 19.64 Wind Energy Combining District

The Wind Energy Combining District contains the following sections applicable to geology and soils:

- **Section 19.64.140(A):** All necessary building and grading permits shall be obtained from the Kern County Planning Department. For construction and permit purposes, all wind turbine generator towers shall conform to the regulations of the applicable seismic zone of the Uniform Building Code and the applicable ground shaking zone.
- **Section 19.64.140(K):** Prior to issuance of any grading permit, a plan for the mitigation of potential soil erosion and sedimentation shall be prepared by a California registered civil engineer or other professional and submitted for the approval by the Director of the Engineering and Survey Services Department.

- Section 19.64.140(L): A minimum of on-site roadways shall be constructed. Temporary access roads utilized for initial machine installation shall be revegetated to a natural condition after completion of machine installation. The project proponent shall submit a plan of all proposed roads, temporary and permanent, for approval by the Planning Director prior to the issuance of any building permits.
- Section 19.64.140(M): Construction of any slopes steeper than four to one (4:1) shall be prohibited unless specifically authorized by the Kern County Planning Department and mitigation is provided.
- Section 19.64.130(N): Soil erosion and sedimentation control plan, including revegetation plan, as provided in Section 19.64.140 (grading permits only).

Kern County Code of Building Regulations (Title 17 of the Ordinance Code of Kern County)

All construction in Kern County is required to conform to the Kern County Building Code (Chapter 17.08, Building Code, of the Kern County Code of Regulations). Kern County has adopted the Uniform Building Code, 2007 Edition, with some modifications and amendments. The entire County is in Seismic Zone 4, a designation previously used in the UBC to denote the areas of highest risk to earthquake ground motion. California has an Unreinforced Masonry program that details seismic safety requirements for Zone 4. Kern County has adopted the seismic provisions associated with Seismic Zone 4.

Chapter 17.28 Kern County Grading Code.

The purpose of the Kern County Grading Code is to safeguard life, limb, property and the public welfare by regulating grading on private property. All requirements of the Kern County Grading Code will be applied during implementation of the proposed project. All required grading permit(s) shall be obtained prior to commencement of construction activities. Sections of the Grading Code that are particularly relevant to geology and soils are provided below.

Section 17.28.140 Erosion Control.

- Slopes. The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection for the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted.
- Other Devices. Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control erosion and provide safety.
- Temporary Devices. Temporary drainage and erosion control shall be provided as needed at the end of each work day during grading operations, such that existing drainage channels would not be blocked. Dust control shall be applied to all graded areas and materials and shall consist of applying water or another approved dust palliative for the alleviation or prevention of dust nuisance. Deposition of rocks, earth materials or debris onto adjacent property, public roads or drainage channels shall not be allowed.

Section 17.28.170 Grading inspection.

- A. General. All grading operations for which a permit is required shall be subject to inspection by the building official. Professional inspection of grading operations and testing shall be provided by the civil engineer, soils engineer and the engineering geologist retained to provide such services in accordance with Subsection 17.28.170(E) for engineered grading and as required by the building official for regular grading.
- B. Civil Engineer. The civil engineer shall provide professional inspection within such engineer's area of technical specialty, which shall consist of observation and review as to the establishment of line, grade and surface drainage of the development area. If revised plans are required during the course of the work they shall be prepared by the civil engineer.
- C. Soils Engineer. The soils engineer shall provide professional inspection within such engineer's area of technical specialty, which shall include observation during grading and testing for required compaction. The soils engineer shall provide sufficient observation during the preparation of the natural ground and placement and compaction of the fill to verify that such work is being performed in accordance with the conditions of the approved plan and the appropriate requirements of this chapter. Revised recommendations relating to conditions differing from the approved soils engineering and engineering geology reports shall be submitted to the permittee, the building official and the civil engineer.
- D. Engineering Geologist. The engineering geologist shall provide professional inspection within such engineer's area of technical specialty, which shall include professional inspection of the bedrock excavation to determine if conditions encountered are in conformance with the approved report. Revised recommendations relating to conditions differing from the approved engineering geology report shall be submitted to the soils engineer.
- E. Permittee. The permittee shall be responsible for the work to be performed in accordance with the approved plans and specifications and in conformance with the provisions of this Code, and the permittee shall engage consultants, if required, to provide professional inspections on a timely basis. The permittee shall act as a coordinator between the consultants, the contractor and the building official. In the event of changed conditions, the permittee shall be responsible for informing the building official of such change and shall provide revised plans for approval.
- F. Building Official. The building official may inspect the project at the various stages of the work requiring approval to determine that adequate control is being exercised by the professional consultants.
- G. Notification of Noncompliance. If, in the course of fulfilling their responsibility under this chapter, the civil engineer, the soils engineer, or the engineering geologist finds that the work is not being done in conformance with this chapter or the approved grading plans, the discrepancies shall be reported immediately in writing to the permittee and to the building official. Recommendations for corrective measures, if necessary, shall also be submitted.

H. Transfer of Responsibility. If the civil engineer, the soils engineer, or the engineering geologist of record is changed during the course of the work, the work shall be stopped until both of the following have occurred:

1. The civil engineer, soils engineer, or engineering geologist has notified the building official in writing that they will no longer be responsible for the work and that a qualified replacement has been found who will assume responsibility.
2. The replacement civil engineer, soils engineer, or engineering geologist notifies the building official in writing that they have agreed to accept responsibility for the work.

3.0 Affected Environment

3.1 Ground Rupture

Ground rupture on a fault is caused when an earthquake produces fault displacement at the surface. The northwest extent of the project site crosses the Garlock Fault and lies within the Alquist-Priolo Special Study Zone. Transmission line alternatives do not cross any principal fault.

Ground rupture and ground failure could occur within 500 feet of an active trace of the Garlock Fault at the project site. The potential for ground rupture to occur at the site is high.

3.2 Seismic Shaking

Seismic waves passing through the earth generated by earthquakes cause the ground to shake. Severe ground shaking is the most widespread and destructive aspect of earthquakes, and the degree of ground shaking is a function of the distance from earthquake epicenter, magnitude of the earthquake, and site-specific soil types, among other factors.

The project area has experienced seismic activity with strong ground motion during past earthquakes, and it is likely that strong earthquakes causing seismic shaking will occur in the future. The significant geologic hazard at the Alta East site is strong ground shaking due to an earthquake. Ground shaking from a magnitude 8.0 earthquake could occur within an approximately 50-mile radius of the site (SEI, 2008).

The controlling fault affecting the Alta East site and the transmission line alternatives is the Garlock Fault that is present through the northwest portion of the site. The Garlock Fault is a near vertical shear zone with a slip rate of approximately 6 millimeters per year with a maximum credible earthquake (MCE) event of 7.3. A geotechnical evaluation was performed at the Terra-Gen Alta-Infill project site, located approximately 7 miles to the southwest. The evaluation determined that the Garlock Fault was capable of generating a peak bedrock acceleration (PBA) of 0.55 g based on the MCE event of 7.3 (SEI, 2008). It is expected that the PBA would be similar at the Alta East project site, but should be assessed from site-specific geotechnical evaluation for the project site. Other faults that are located within a 50-mile radius of the site are capable of generating a PBA range of 0.10 g to 0.22 g (SEI, 2008).

3.3 Liquefaction

During strong ground shaking, loose, saturated, cohesion-less soils can experience a temporary loss of shear strength and act as a fluid. This phenomenon is known as liquefaction. Liquefaction is dependent on depth to water, grain size distribution, relative density of the soils, degree of saturation, and intensity and duration of the earthquake. The potential hazard associated with liquefaction would be seismically induced settlement and possible surface displacement from lateral spreading.

The lithology at the Alta East site and transmission line alternatives predominantly consists of dense decomposed granitic material and rock. In addition, the depth to water at the site is approximately 40 feet bgs. The project area has not been identified by Kern County as an area that is subject to liquefaction hazards (Kern County, 2007). The potential for liquefaction to be a hazard at the site and along the transmission line alternatives is considered to be negligible.

3.4 Slope Stability

Slope stability or mass wasting depends on steepness of the slope, underlying geology, surface soil strength, and moisture in the soil. Significant excavating, grading, or fill work during construction might introduce a slope stability or mass wasting hazard at the project site.

The turbines will be placed on competent hill tops or ridges that will be graded to minimize the potential for movement. The potential for direct impact from mass wasting at the site and along transmission line alternatives is considered low.

3.5 Subsidence/Settlement

Subsidence or settlement can be a natural or man-made phenomenon resulting from tectonic movement, consolidation, fluid removal (oil, gas, or water), or rapid sedimentation or oxidation of organic-rich soil. Organic-rich soils are not typically present in the project site.

Based on a review of the geologic setting in the project site area, the lithology present in the subsurface appears to have a low potential for settlement or subsidence.

3.6 Expansive Soils

Expansive soils shrink and swell with drying and wetting. The shrink-swell capacity of expansive soils can result in differential movement beneath foundations.

The soil present at the site and along the transmission line alternatives are primarily sands, gravels and rock that typically would not exhibit shrink and swell characteristics. Clays and other fine grained soils are not expected to be common at the project site area. As a result, the potential for expansive soils to be present at the site is low.

3.7 Geological Resources of Recreational, Commercial, or Scientific Value

According to the maps of the State of California Division of Oil, Gas and Geothermal Resources (DOGGR, 2010), there are no oil or gas well fields or reserves that are in the project vicinity.

There are several former or currently operating mines that are in the surrounding project vicinity. A detailed analysis for these mines was performed in March 2009 for the Golden

Queen Mining Co. and documented in the SRK Consulting report for the Soledad Mountain Project (SRK, 2006). At the project site, information obtained from the Kern County Engineering and Survey Services Department and the California Division of Mines and Geology indicated no active or abandoned mines on the Alta East property (LAC, 2009). An inactive quarry was identified adjacent to and north of Property Section 28. The former quarry was used to surface mine aggregate materials for roads, etc. Based on the lack of identified concerns related to mining on the project site, it is considered likely that the area of "disturbed land" is associated with earthworks operations for the former aqueduct channel which runs through the southeast corner of Section 26. No evidence of mine tailings or waste was observed on the Property during LAC's reconnaissance (LAC, 2009).

4.0 Environmental Impacts and Recommendations

The potential effects from construction and operation of Alta East project (including transmission line alternatives) on geologic resources and risks to life and property from geologic hazards are presented in the following sections. Adverse effects in terms of geological hazards and soil resources could occur when a proposed action:

- Exposes people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - Rupture of a known earthquake fault (Alquist-Priolo Fault Zone)
 - Strong seismic ground shaking
 - Seismic-related ground failure, including liquefaction
- Is located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Results in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- Results in the loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan.

4.1 Geologic Hazards

There is significant potential for moderate to severe seismic ground shaking or surface fault rupture to affect the project site in the event of a large magnitude earthquake occurring on fault segments near the project, particularly as related to the Garlock Fault. The northwestern part of the site includes an area that lies within a designated Alquist-Priolo Fault Zone of the Garlock Fault. Damage to wind turbines, project facilities, and transmission alternatives could occur from an earthquake event that causes ground rupture and/or severe ground shaking.

Under the Alquist-Priolo Earthquake Fault Zoning Act, no commercial or industrial structures may be located within an Earthquake Fault Zone delineated on an official map unless geologic investigations are conducted at the site. Adherence to the CBC standards would reduce the potential for structural damage to project facilities to the extent possible. However, given the proximity of the project to the Garlock Fault, and the potential regional seismic activity, structural damage could occur.

Seismic and ground rupture hazards will be minimized by conformance with the recommended seismic design criteria of the 2007 California Building Code (CBSC, 2007).

The probability of liquefaction, mass wasting, subsidence, or expansive soil at the project site and along transmission line alternatives is expected to be low to negligible.

In summary, compliance with the 2007 CBC requirements will reduce the exposure of people to the risks associated with large seismic events and ground rupture to less than significant levels. In addition, major structures will be designed to withstand the strong ground motion of a Design Basis Earthquake (DBE), as defined by the 2007 CBC. By complying with CBC standards, impacts associated with geologic hazards will be less than significant.

4.2 Geological Resources

The proposed Alta East project would not result in a loss of availability of a known mineral resource that would be of value to the region and the residents of the state. In addition, the project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan. No impacts to geologic resources are anticipated.

4.3 Mitigation Measure

To address potential impacts related to geologic hazards, the following mitigation measure is proposed for the project:

- Structures will be designed to meet seismic requirements of the 2007 CBC. Moreover, the design of structures and equipment will be in accordance with 2007 CBC earthquake design requirements to withstand the ground motion of a DBE.

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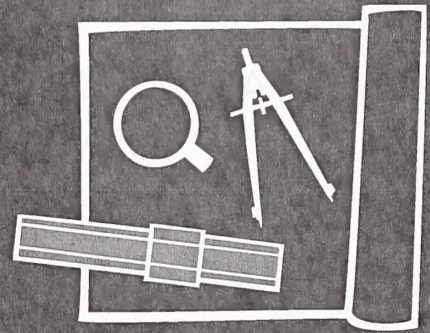
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CALIFORNIA DESERT CONSERVATION AREA PLAN
UTILITY CORRIDOR ANALYSIS

Alta East Wind Project

Kern County, California

April 2011



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Submitted to

Bureau of Land Management

California Desert District

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INTRODUCTION

The Alta East Wind Project is proposed to be located on approximately 3,200 acres on the north and south sides of State Route (SR) 58 in southeastern Kern County, California, within an area of existing wind development. The Project area is approximately 3 miles northwest of the Town of Mojave and approximately 11 miles east of the City of Tehachapi. On May 12, 2010, Alta Windpower Development, LLC (AWD) submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299) to the BLM to secure a Right-of-Way Grant for the Alta East Wind Project. On May 12, 2010 a Type 3 Grant Application (CACA-052537) was filed for the proposed project. Additional information on the project, along with a revised Form SF-299, was filed on October 15, 2010. The location of the Project site is shown in *Figure 1: Regional Vicinity Map*. (Courtesy of CH2M Hill)

The proposed development is a wind energy facility, consisting of up to 120 wind turbine generators (“WTG” or “turbines”) with a nameplate capacity rating of up to 360 megawatts (MW), their ancillary facilities, and supporting infrastructure, pursuant to Chapter 16.94 of the Kern County Zoning Ordinance. Up to 120 WTGs, access roads, and transmission line routes would be located on a portion of the 3,200 acre project area that encompasses land managed by Kern County and the BLM. Approximately 65 percent of the Project area would be located on land managed by BLM, and approximately 69 to 72 percent of the WTGs would be located on land managed by BLM. Specifically, the Project would be located on portions of parcels managed by the BLM, as listed in *Table 1* below.

Table 1 BLM Parcels Proposed for Wind Energy Development

Township¹	Range¹	Section¹	Assessor Parcel Number
32 South	35 East	26 SW ¼, W ½ SE ¼	224-241-28
32 South	35 East	34 All	224-242-10
32 South	35 East	28 Lots 1-4, N ½, SE ¼	224-281-03
32 South	35 East	32	224-281-05
12 North	13 West	34 All	224-291-01

Notes:

¹ San Bernardino Baseline and Meridian, Kern County, CA

A preliminary estimate of total land area within the Project area is approximately 3,200 acres, of which approximately 2,083 acres are under the jurisdiction of BLM. Wind energy development area is anticipated to cover approximately 2,431 acres onsite, of which 1,750 are on BLM land. Two options (Option A and Option B) for turbine layout on the project site have been identified. One turbine layout will ultimately be selected during final design and constructed. The layout for each option is provided in *Figures 2a and 2b: Project Area and Wind Energy Development Area – Option A and Option B*. (Courtesy of CH2M Hill)

This Utility Corridor Analysis has been prepared at BLM's request to determine if the proposed Project is consistent with the BLM's California Desert Conservation Area (CDCA) Plan. The CDCA plan was approved in 1980, and is the management plan for the BLM-administered portion of the 25-million-acre CDCA designated by Congress in 1976 through the Federal Land Policy and Management Act. The BLM manages about 10 million acres of the CDCA with the CDCA Plan.

This analysis was requested by the BLM California Desert District (CDD) because the Project would be located on BLM land and partially within CDD Designated Utility Corridor A. This corridor is approximately 2 miles wide and partially covers the eastern quarter of the project on both BLM and private land as shown on *Figure 3: Utility Corridor Map*. There are two 230kV transmission lines as well as two concrete-channel aqueducts, all owned by Los Angeles Department of Water & Power (LADWP), currently located within the CDD Corridor. The entire existing infrastructure within the Corridor is located beyond the limits of the project. This analysis has been prepared to respond to BLM's request and is intended to provide supplemental information on the potential compatibility and conflict issues associated with the proposed Project's use of the requested right-of-way.

SITE ASSESSMENT

Ownership and rights-of-way within CDD Utility Corridor A and BLM land in the vicinity of the project boundary area were determined by examining the Project ALTA Survey and a search of the BLM LR 2000 database.

Figure 4: BLM and Kern County Land Use Designations (Courtesy of CH2M Hill) summarizes the existing uses of the land surrounding the project area. *Table 2* below summarizes the known easements within the project boundary on BLM land and the CDD Designated Utility Corridor A. Many of the easements listed in the table are blanket in nature or lack supporting documentation that specifies the location of the easement or right-of-way.

Table 2 Utility Easement Matrix

Owner	Section	Township	Range	Location Relative to the BLM Project Area	Use(s)	Width (feet)	BLM Serial File Number
Southern California Edison Co.	28	32	35	A transmission line right-of-way with no supporting documents or location provided.	Transmission Line	N/A	CACA 0 020265
Echo Mining Co.	28	32	35	A pipeline right-of-way dated back to March 20, 1906 with no specific location described.	Water Plants	N/A	CALA 0 142891
Karma Mining Co.	28	32	35	A pipeline right-of-way dated back to March 20, 1906 with no specific location described.	Water Plants	N/A	CALA 0 142891
Queen Esther Mining Co.	28	32	35	A pipeline right-of-way dated back to March 20, 1906 with no specific location described.	Water Plants	N/A	CALA 0 142891
CA Dept Transportation	28	32	35	A drainage right-of-way with no specific location described.	Fed Aid Highway	N/A	CAS 0 036175
SBC California - Cindy Lee	28	32	35	Power line and poles following the northern boundary of state highway 58. This falls outside of the proposed turbines for the project. No supporting document was found	Tel & Teleg Line	N/A	CARI 0 004623
F.A. Berry and Patrick J. O'Neill	28	32	35	Unknown	Oil & Gas Lease	N/A	N/A
State of California Public Works	28	32	35	Highway right-of-way runs east and west through section 28.	Road	400	N/A
Water Pipes	26	32	35	Water pipe easement that's blanket in nature	Water Pipes	100	N/A
State of California Public Works	26	32	35	Highway right-of-way runs east and west through section 28.	Road	400	N/A
N.D. Oswald	32	32	35	Unknown	Quitclaim deed	N/A	N/A
General Public	32	32	35	Easement for public to use road within Cache Circle.	Road	N/A	N/A
Public General	32	32	35	Easement for ingress, egress and road for utility purposes	Road	30	N/A
Wind Energy Company	32	32	35	A right-of-way grant for the energy company to put up wind turbines. Northeast of project boundary.	Turbines	N/A	N/A
Soledad Pipeline	32	32	35	Easement for interest in Soledad Pipeline	Pipeline	N/A	N/A

Section 28 Township 32 Range 35

There are eight right-of-ways located in section 28 township 32 range 35 within the project boundary on BLM land. All but one of the listed easements in this section are unplottable as the supporting documents do not show up in the title search or the easements were blanket in nature. The State of California Public Works has a 400' right of way for State Highway 58, which runs east and west through section 28. The following easements are listed in the title search but do not specify locations within the section:

- Southern California Edison Company transmission line easement
- Echo Mining, Karma Mining and Queen Esther Mining Company pipeline easement
- California Department of Transportation drainage easement
- SBC California telephone easement line
- Unplottable easements in section 28 include an oil and gas lease that belongs to F.A. Berry and Patrick J. O'Neill.

Section 26 Township 32 Range 35

In section 26 township 32 range 35 there are two right-of-ways found in the title report. Neither of the following easements falls inside of the project boundary. The first easement is for water pipe lines which traverse north to south along the southern central of the section. This 100' easement is approximately located per the assessor's map. The second easement is for the State of California Public Works has a plotted easement for State Highway 58 which runs east and west through the section.

Section 34 Township 32 Range 35

There are no easements returned in title search for section 34 township 32 and range 35.

Section 32 Township 32 Range 35

In section 32 township 32 and range 35 there are five easements in the title report, however none of the easements are located within the project boundary. There is a general public easement for ingress, egress and roads for utility purposes which are found directly west of the proposed project boundary. Northeast of the proposed project boundary lies a right-of-way grant for a wind energy company which allowed the company to construct existing turbines. The final plotted easement is in favor of the general public for road purposes through Cache Creek. There are two unplottable easements in this section. The first easement is for interest in Soledad Pipe Line that is blanket in nature. The second blanket in nature easement is a quitclaim deed by N.D. Oswald dated back to 1905.

Section 34 Township 12 Range 13

There are no easements returned in title search for section 34 township 12 and range 13. Utility Corridor A is an approximately a two-mile-wide corridor that lies partially within the study area. It runs in a northeast to southwest direction, partially along the proposed eastern quarter of the project boundary. It currently contains four overhead, high-voltage transmission lines that transport electrical power consumed in southern California. The Other utility found in the corridor near the project site is the 200' LADWP aqueduct easement.

ANALYSIS OF CONFLICTS WITH EXISTING USES

The project proposes to place wind turbines on both private and BLM land, with parts of the BLM land falling under the CDD Designated Utility Corridor A shown on figures 2A and 2B. The development area will be fenced according to the Kern County zoning ordinance. The fencing will either encompass the entire project perimeter or be localized at wind turbine generators sites and supporting infrastructure such as the project substation, maintenance facility, and interior roads. Based on the ALTA Survey provided by Smithco Surveying Engineering, Inc., there are no plotted easements that fall inside the project boundary. Therefore construction will not impact any plotted easements. There are easements that are blanket in nature that fall within the BLM lands within the project sections, but it is not anticipated that construction will affect any existing utilities. In summary, the proposed project will not be in conflict with any existing uses.

ANALYSIS OF CONFLICTS WITH FUTURE USES

Portions of the CDCA Utility Corridor A will fall within the fenced project areas required by Kern County Zoning Ordinance. At this time there are no other pending applications for rights-of-way in CDD Utility Corridor A in the project area. However, because the proposed BLM Right-of-Way Grant for the project has a 30 year duration, future applications may be submitted.

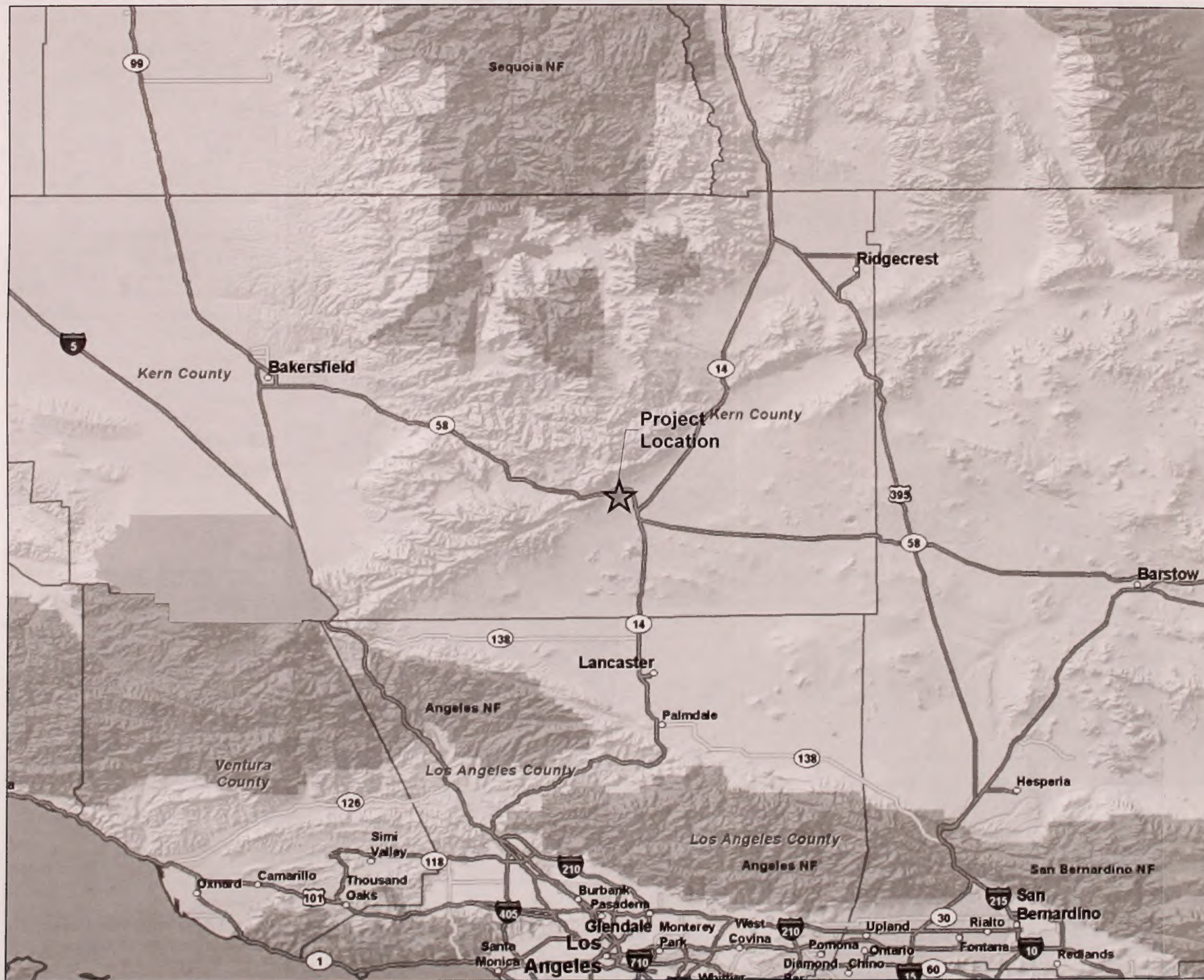
The proposed wind turbine generators will be stable as they will be constructed on spread concrete foundations; therefore, underground utilities constructed with a directional bore or open trench will not impact the installed wind turbine generators. Additionally the wind turbine generators will be installed in linear rows with approximately 1,000 to 2,000 feet between turbine rows. This space could be utilized for future underground utility corridors. There will be approximately 1,000 feet between adjacent turbine rows in the project and the closest transmission line right-of-way to the east within the Utility Corridor A. Assuming a 500 foot setback for the turbine and an individual right-of-way width of 200 feet per transmission line, this area could accommodate up to two new high voltage transmission lines and associated structures on the project side of the corridor for future use. The other half of the corridor will remain one mile wide and unaffected by the project, thus leaving the entire half of the corridor open for future utilities. Underground collection lines will generally follow roads constructed for the project, and will remain easily identified. The existence of roads in the project area will actually be beneficial to accessing the site for future uses.

ANALYSIS OF COMPATIBILITY WITH CORRIDOR DESIGNATION

AWD's selection of the project site is compatible with BLM's utility corridor designation purpose. BLM's Record of Decision for the Designation of Energy Corridors on BLM-Administered Lands in the 11 Western States (2009) explains that the Section 368 (of the Energy Policy Act of 2005) corridors were sited "to avoid, to the maximum extent possible, significant known resource and environmental conflicts" and "to promote renewable energy development in the West." These goals are fulfilled by situating the project, a 360 MW renewable energy project to fulfill California's Renewable Portfolio Standard, near Utility Corridor A. As proposed, the project would allow the existing utility corridors to accommodate existing, currently proposed, and future right-of-way without conflict. There are no existing easement conflicts through the proposed project site. After construction, up to two new transmission lines could be accommodated into the Utility Corridor A between the project and the existing LADWP transmission line and other development activities could be undertaken in the mile of unaffected corridor located east of the existing LADWP transmission line. A resolution in favor of joint use of this area is requested, to allow both the development of the project and to provide for future growth of energy transmission through this corridor.

A: Figures Referenced in Study

- Figure 1: Regional Vicinity Map
- Figure 2a: Project Site Map-Option A
- Figure 2b: Project Site Map-Option B
- Figure 3: Utility Corridor Map
- Figure 4: Kern County and BLM Land Use

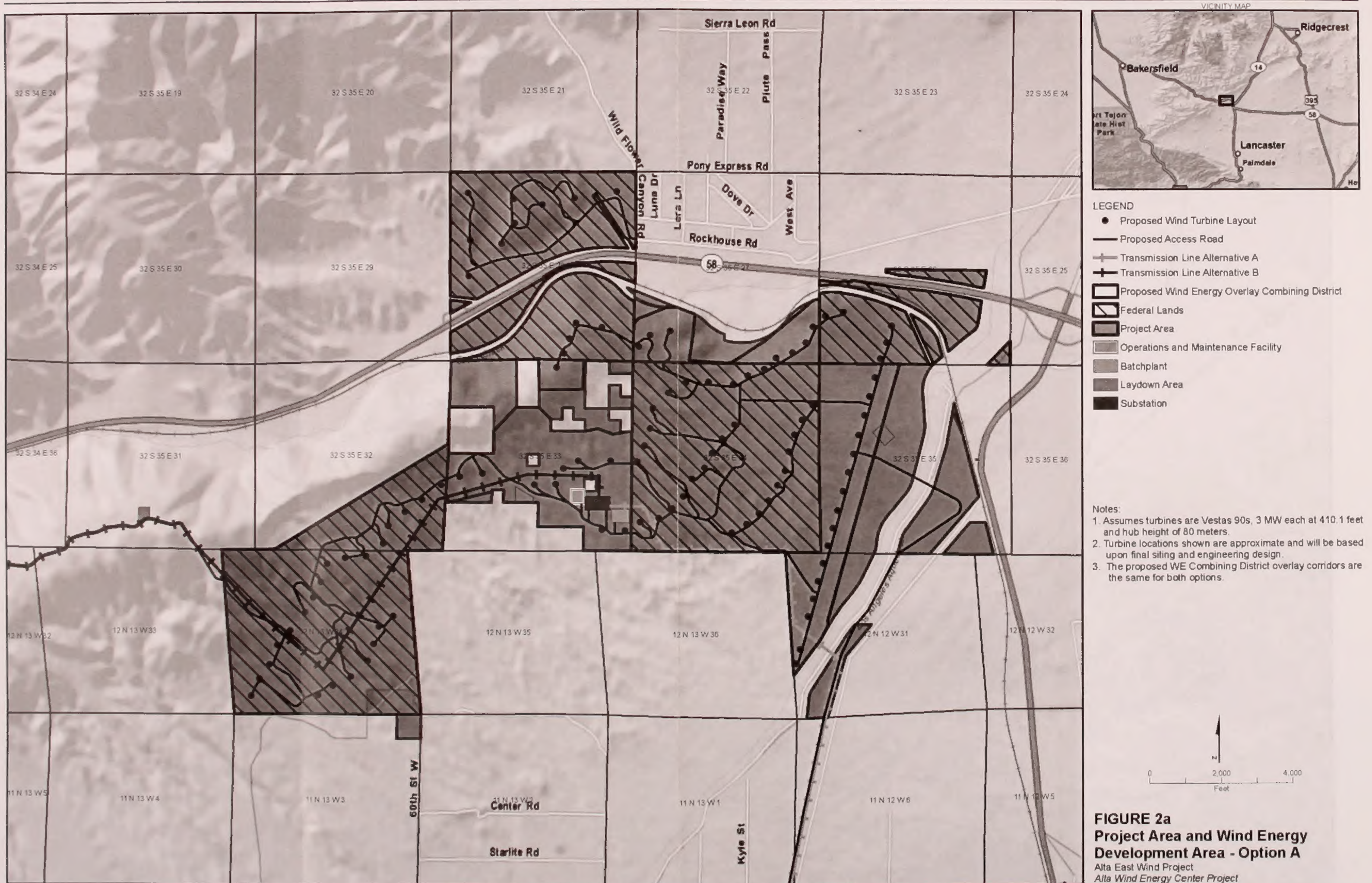


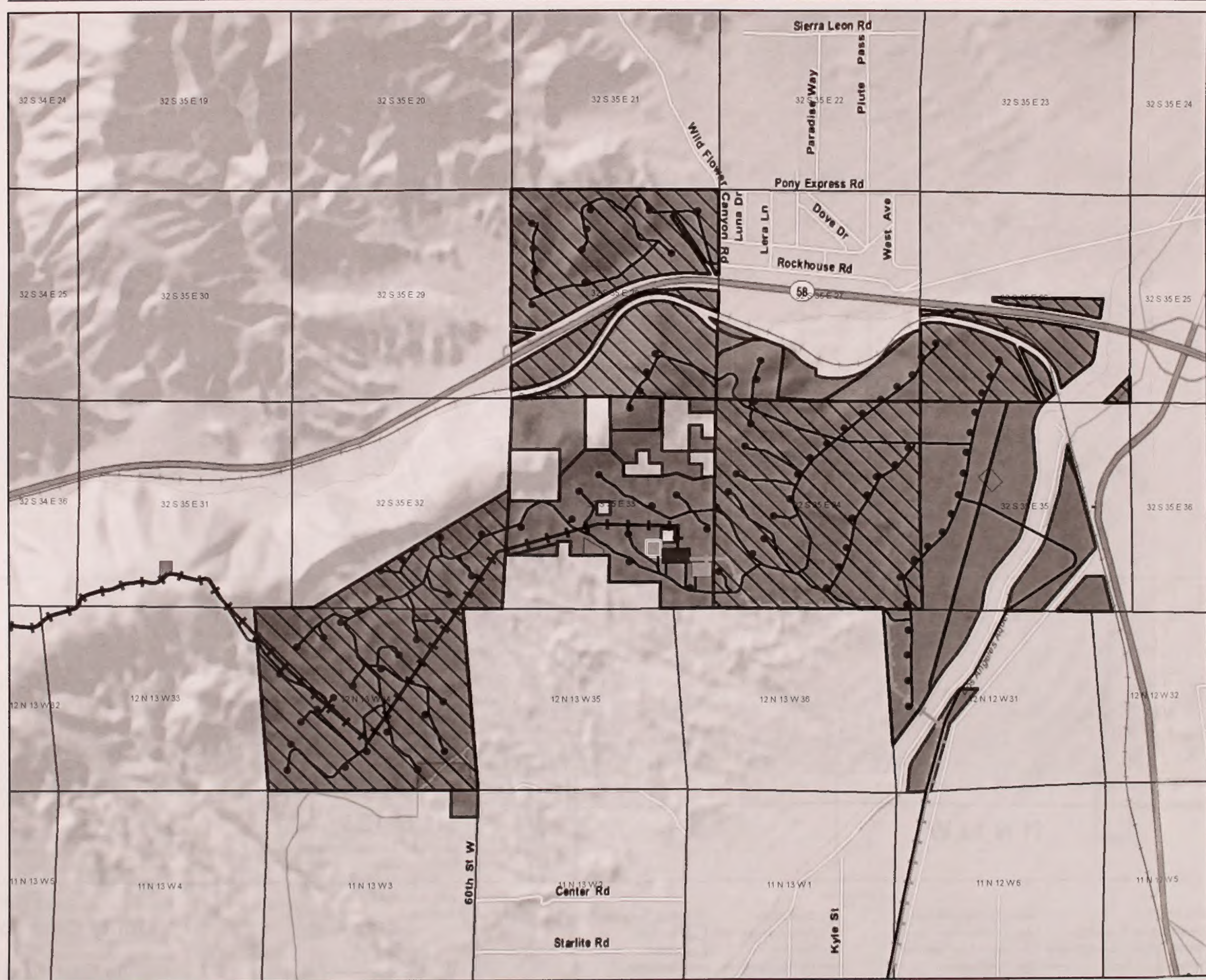
LEGEND

- ★ Alta East Project Area



FIGURE 1
Regional Vicinity Map
 Alta East Wind Project
 Alta Wind Energy Center Project





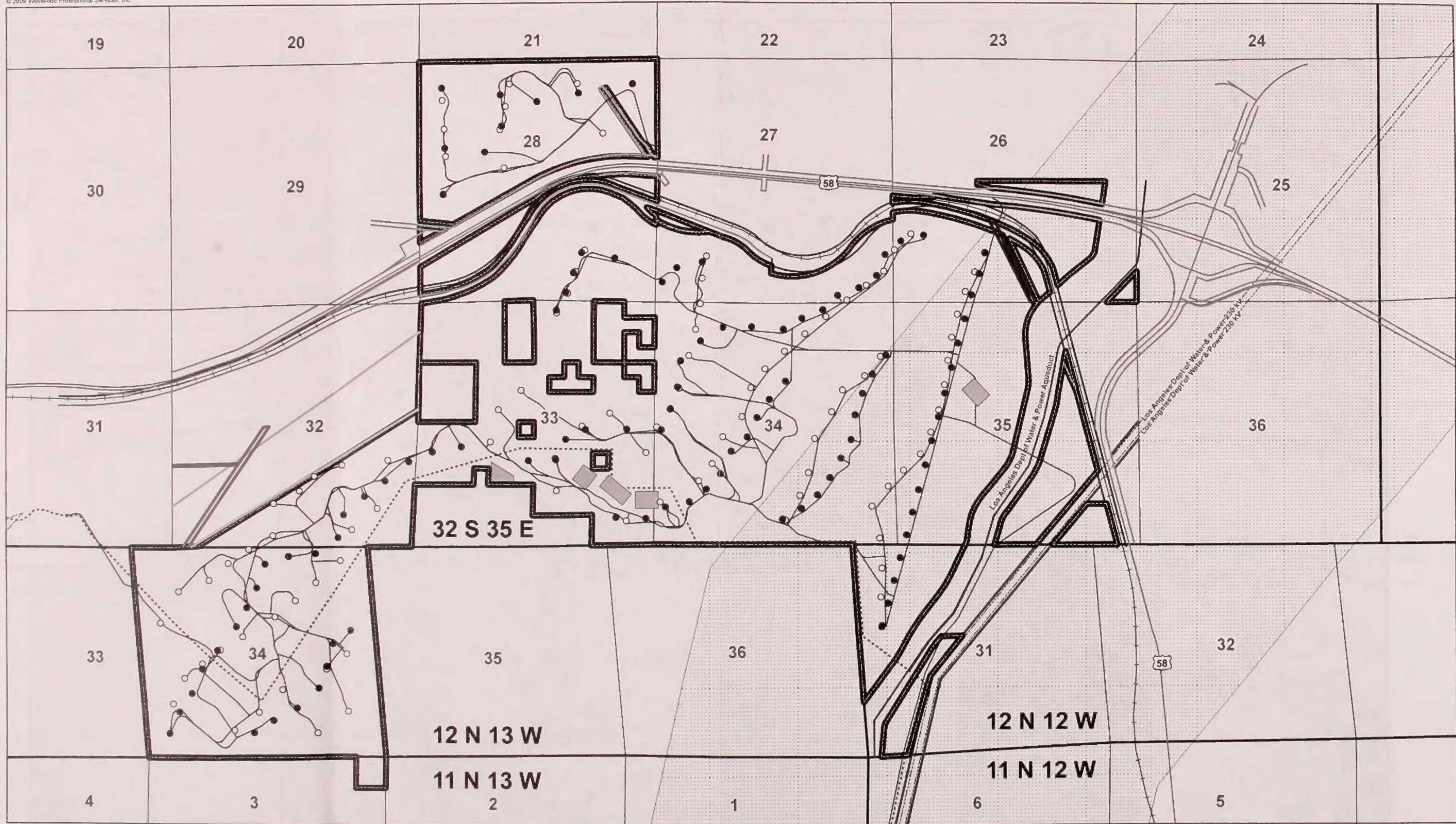
- LEGEND**
- Proposed Wind Turbine Layout
 - Proposed Access Road
 - Transmission Line Alternative A
 - Transmission Line Alternative B
 - ▨ Proposed Wind Energy Overlay Combining District
 - ▨ Federal Lands
 - ▨ Project Area
 - ▨ Operations and Maintenance Facility
 - ▨ Batchplant
 - ▨ Laydown Area
 - ▨ Substation

- Notes:**
1. Assumes turbines are Vestas 90s, 3 MW each at 410.1 feet and hub height of 80 meters.
 2. Turbine locations shown are approximate and will be based upon final siting and engineering design.
 3. The proposed WE Combining District overlay corridors are the same for both options.



FIGURE 2b
Project Area and Wind Energy Development Area - Option B

Alta East Wind Project
 Alta Wind Energy Center Project



Data Source(s): BLM California State Office (2011), BLM GIS Website (Accessed April 2011), Terra-Gen Power, LLC (2011) and Westwood (2011).

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- | | | | |
|------------------------------|--|-------------------|-----------------------------------|
| Project Boundary | Existing Turbine Easement | State Route | CDD Designated Utility Corridor A |
| Proposed Turbines (Layout A) | Existing Transmission Lines | Road Highway ROW | Township |
| Proposed Turbines (Layout B) | Transmission Line Easement | Railroad | Section |
| Proposed Access Roads | Water Pipe Easement | Railroad Easement | Land Ownership |
| Proposed Transmission Line | General Public Easement | LADWP Aqueduct | Bureau Of Land Management |
| Wind Energy Facilities | (For ingress, egress and road for utility) | | Private/Other Ownerships |



FIGURE 3
Utility Corridor Map

Alta East Wind Project
Alta Wind Energy Center Project



LEGEND

Project Area

BLM CDCA Plan

Multiple Use Class L (Limited)

General Plan

Extensive Agriculture (Min. 20 Acre Parcel Size) (1)

Highway Commercial (2)

Maximum 1 Unit/Net Acre (3)

Mineral and Petroleum (Min. 5 Acre Parcel Size) (4)

Minimum 2.5 Gross Acres/Unit (5)

Minimum 20 Gross Acres/Unit (6)

Minimum 5 Gross Acres/Unit (7)

Other Facilities (8)

Resource Agriculture (Min. 20 Acre Parcel Size) (9)

Resource Management (Min. 20 Acre Parcel Size) (10)

Service Industrial (11)



FIGURE 4
BLM and Kern County
Land Use Designations
 Alta East Wind Project
 Alta Wind Energy Center Project

Paleontological Resources Assessment

Alta East Wind Project – Initial Paleontological Resources Assessment

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Patti Murphy, CH2M HILL

DATE: October 7, 2010

1.0 Introduction

This technical memorandum describes the potential for encountering paleontological resources, and potential impacts to paleontological resources during construction of the Alta East Wind Project (see Figure 1), including the wind project and three transmission line alternatives, proposed in October 2010 for development by Alta Windpower Development, LLC (AWD). AWD anticipates selecting one transmission alternative for detailed design and construction; final selection will occur in late 2010. Although AWD will select only one transmission route for the project, this analysis evaluates potential geologic impacts from all three transmission line alternatives. The project area is located in the extreme western Mojave Desert north and south of California Route 58 in the eastern approaches to Tehachapi Pass. In this area the Tehachapi Mountains in the south meet the southern-most Sierra Nevada to the north. The project area is chiefly on land managed by Kern County and by the Ridgecrest District of the U.S. Bureau of Land Management (BLM).

A description of the laws, ordinances, regulations, and standards applicable to paleontological resources is presented in Section 2.0. The environmental setting, including discussion of the geologic setting, is presented in Section 3.0. The impacts analysis, including discussion of the project impacts and associated mitigation measures, is presented in Section 4.0. The references used in this chapter are listed in Section 5.0.

2.0 Regulatory Setting

The laws, ordinances, regulations, and standards governing paleontological resources at the federal, state, and local level, and which are applicable to the Alta East project, are discussed below.

2.1 Federal

Paleontological resources are protected by several federal regulations applicable to excavations and construction on federal land, or to projects requiring a federal permit or entitlement. As the project includes components on land managed by the BLM, these federal statutes are applicable to the project.

Paleontological resources were first protected under the Federal Antiquities Act of 1906 (PL 59-209; 16 United States Code [USC] 431 et seq.; 34 Stat. 225). This statute calls for the protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. Further federal protection of paleontological resources is provided by the Federal Land Management and Policy Act ((43 USC 1712[c], 1732[b]); sec. 2, Federal Land Management and Policy Act of 1962 [30 USC 611]; Subpart 3631.0 et seq., Federal Register Vol. 47, No. 159, 1982). This regulation charges federal agencies to manage public lands in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, archaeological, and water resources, and where appropriate, preserve and protect certain public lands in their natural condition (Section 102[a][8][11]); periodically inventory public lands so that the data can be used to make informed land-use decisions (Section 102[a][2]); and regulate the use and development of public lands and resources through easements, licenses, and permits (Section 302[b]). While paleontological resources are not specifically mentioned, significant fossils are understood to be scientific resources.

The National Environmental Protection Act (NEPA) (USC, section 4321 et seq.; 40 Code of Federal Regulations [CFR], section 1502.25) requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage.

The CFR Title 43, Section 8365.1-5 prohibits the collection of scientific resources on public lands, including vertebrate fossils, without a permit, as well as the use of fossils found on federal land for commercial purposes.

Recently, the Omnibus Public Land Management Act of 2009 was passed. This statute includes many protections for historic and prehistoric resources on public lands, and bans the destruction or removal of paleontological resources from public lands. It charges land managers with the responsibility for inventorying paleontological resources and to use scientific principles in their management.

In addition to these measures, the BLM has issued BLM Instructional Memorandum 2008-009 (BLM, 2008), which describes the requirements for inventory and assessment of paleontological resources on public lands, as well as requiring a paleontological use permit for excavation work performed on BLM lands.

2.2 State

At the state level, the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Sections 21000 et seq.) requires public agencies and private interests to identify the environmental consequences of their proposed projects on any object or site of significance to the scientific annals of California (Division I, PRC: 5020.1[b]). Although CEQA does not define what is "a unique paleontological resource or site," Section 21083.2 defines "unique archaeological resources" as "any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.



Legend

- Project Area
- Two-Mile Buffer
- Proposed Transmission Line Alternatives**
 - Transmission Line Alternative A
 - Transmission Line Alternative B
 - Transmission Line Alternative C

Surficial Geology

- Qa - Alluvium
- Qoa - Older Alluvium
- Qot - Terrace Gravel
- Th - Horned Toad Formation
- Tr - Rhyolitic Felsite
- bc - Bean Canyon Formation
- gn - Gneissic Rocks
- qm - Quartz Monzonite

Notes:

- Qa - Undissected unconsolidated gravel, sand, and silt.
- bc - Marble, hornfels, schist, phyllite, and quartzite.
- gn - Quartz diorite gneiss and gneissoid quartz diorite, some biotite schist, and micaceous quartzite.
- Qoa - Dissected slightly consolidated alluvial sediments: fanglomerate, gravel, sand, silt, and clay, mostly of granite detritus.
- Qot - Terrace gravel
- Th - Gray clay shale, white marl, buff sandstone, reddish siltstone, and basal granitic conglomerate. Age, middle Pliocene (Hemphillian).
- Tr - Intrusive into Kinnick and older formations

Source:

Geologic Map of California. Bakersfield Sheet.
1:250,000 scale. Division of Mines and Geology. 1964

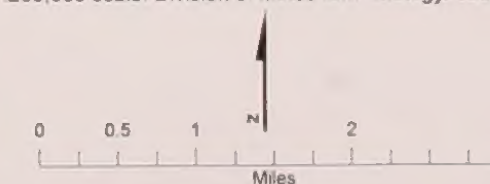


FIGURE 1
Surficial Geology

Alta East Wind Project
Alta Wind Energy Center Project

2. It has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event.

With only slight modification, this definition is equally applicable to recognizing “a unique paleontological resource or site.” Additional guidance is provided in CEQA Section 15064.5(a)(3)(D), which indicates “Generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, important information in prehistory or history.”

2.3 Kern County

The Kern County General Plan (Section 1.10.3.25.M) (County of Kern, 2007) calls for the preservation of paleontological resources where feasible.

2.4 Professional Standards

The Society of Vertebrate Paleontology (SVP), an international scientific organization of professional paleontologists, has established guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data recovery, specimen preparation, analysis, and curation (SVP, 1995; 1996). Most practicing professional paleontologists follow the SVP guidelines which, with appropriate accommodations for the nature of fossils, also apply to paleobotanical and invertebrate faunal remains.

3.0 Environmental Setting

3.1 Regional Geology

The project site straddles the desert floor and the foothills of the Tehachapi Mountains and lies within the Mojave Desert geomorphic province. The terrain of the area is mountainous in the west and generally flat in the east with a southeasterly slope. The Mojave Desert region is geologically young and seismically active. The geology of the region around the site is very complex, reflecting geological processes driven by active tectonics and rapid erosion primarily from the result of movement along the San Andreas and Garlock fault systems. Many active faults are present in the general area of the site (CGS, 2010).

3.2 Local Geology

The local geology of a project area determines its paleontological potential. This site is dominated by alluvial material derived from erosion of the adjacent highlands, and granitic bedrock of the Tehachapi Mountains (LAC, 2009). Generally, the site is composed of sand, gravel, and cobbles with very little to no fine-grained soils. Cretaceous quartz monzonite forms the basement of stratigraphic sequences in the Mojave Block in the vicinity of the project area. The quartz monzonite is overlain by Miocene-age volcanic rocks (LAC, 2009) in a few areas, and by late Miocene and Quaternary sediments elsewhere.

While good information on the bedrock geology of the project area is available (Dibblee, 1967; LAC, 2009; and Smith, 1964), Quaternary and surface sediments are not mapped in detail. These sediments can be important because, as Quade et al. (1995) demonstrated,

ancient groundwater discharge deposits were widespread in the Mojave Desert during the Pleistocene. These deposits are inevitably associated with fault zones which acted to channel artesian water to the surface, and the Garlock Fault runs through the northern portion of the project.

The geological units within the project area include the following, and can be seen in Figure 1:

- *Alluvium*: Alluvium of Late Pleistocene and Holocene age.
- *Older Quaternary Alluvium*: Conglomerates and terrace gravels, often dissected and indurated. Finer grained facies include silt and sand. The detritus is almost exclusively of granitic origin.
- *Quaternary Terrace Gravel*: This is coarse grained, and of limited extent in the project area (impacting only transmission line Alternative B). Because of the limited geographic extent of this unit, for the purposes of this report it is considered equivalent to the Older Quaternary Alluvium.
- *Horned Toad Formation*: This geological unit is composed of deep deposits of terrestrial sandstones and clays. It rests unconformably on granitic basement rocks and is restricted to the Horned Toad Hills northwest of Mojave.
- *Older Tertiary Rhyolitic Felsite*: An intrusive igneous unit of limited extent in the project area.
- *Older Basement Rocks*: These are granitic rocks and associated metamorphic suites, in this area restricted to gneissic rocks. There are no marble pendants associated with granitic rocks in the project vicinity as there are elsewhere.

A review of remote imagery failed to identify any lineaments or other features such as spring mounds that might indicate the presence of paleospring deposits in the area (see Quade et al., 1995). Fresh exposures of relative old Quaternary alluvium, some with volcanic ash or other fine-grained high-albedo sediment, were in evidence along the Garlock Fault, however.

Absence of marble pendants indicates that caves and rock shelters are generally absent, and therefore the potential of locating Pleistocene packrat middens (e.g. Cole, 1983) is very low.

3.3 Paleontological Records Search Results

Paleontological records searches have been performed over the last year for a number of projects in the vicinity. Those consulted for this project include a records review by the San Bernardino County Museum (SBCM) for a geologically similar area immediately to the south and west (see Appendix 1). No fossil records were identified in the project area. This is consistent with a June 2010 records search using the SBCM's online paleontological database tool (SBCM, n.d.). However, the SBCM database has no paleontological localities at all recorded in Kern County which indicates that it may not be updated for this county. Querying the University of California Museum of Paleontology online database (UCMP, n.d.), however, yields 1,620 fossil locality records for Kern County. Many of these are far from the current project area, including such famous locales as Shark Tooth Hill near

Bakersfield and the McKittrick Tar Pits on the other side of the Central Valley. However, there are a number of fossil localities recorded for the Horned Toad Formation in the Horned Toad Hills within and adjacent to Section 34 (Figure 1). These localities appear to lie within the project area to the extent that development is planned.

Other than those from the Horned Toad Formation, there are no paleontological records from any geologic unit occurring within or close to the project area.

4.0 Environmental Impacts and Recommendations

The potential effects from construction and operation of the Alta East project and transmission corridor on paleontological resources are assessed in the following sections. These potential impacts consist of damage or destruction of fossils, or improper removal of fossils from the sediments they are found in.

4.1 Significance Criteria

With respect to paleontological resources, the determination of significance for stratigraphic units is based upon the abundance of fossil specimens or sites within a stratigraphic unit and the quality of fossils previously recovered from that unit. The determination of significance for individual fossils is based upon the importance of the individual fossil. The following describes how paleontological resources are assessed for scientific significance.

In its standard guidelines for assessment and mitigation of adverse impacts to paleontological resources, the SVP (1995) established three categories of sensitivity for paleontological resources: high, low, and undetermined. To these categories is added that of “moderate,” following common usage in CEQA reviews of paleontological sensitivity of sediments for sites on coastal California. These four classifications are also similar to the BLM potential fossil yield classification system. The paleontological importance or sensitivity of a stratigraphic unit reflects its potential paleontological productivity and the scientific significance of the fossils it has produced. The potential paleontological productivity of a stratigraphic unit exposed in the project area is inferred from the abundance of fossil specimens and/or previously recorded fossil sites in exposures of the unit. The underlying assumption of this assessment method is that a stratigraphic unit is most likely to yield fossil remains in a quantity and of a quality similar to those previously recorded from the unit elsewhere in the area.

An individual fossil specimen is considered scientifically important and therefore significant if it is identifiable; complete; well preserved; age diagnostic; useful in paleoenvironmental reconstruction; a type or topotypic specimen; a member of a rare species; and/or a skeletal element different from, or a specimen more complete than, those now available for the species (SVP, 1995). For example, vertebrate remains, such as those previously uncovered in the Horned Toad Hills, are comparatively rare in the fossil record and most identifiable vertebrate remains are therefore scientifically significant.

4.2 Significance of Paleontological Resources

Below is a summary of the paleontological sensitivity of the geologic units in the project area, based on a previous literature and records review.

- *Alluvium*: The depositional environment of these units (energetic, subaerial deposition in arid climates) is not conducive to the formation or preservation of significant paleontological resources. Therefore these sediments have a low paleontological sensitivity (BLM Potential Fossil Yield Classification [PFYC] Class 1).
- *Older Quaternary Alluvium*: These units are not generally known to be fossiliferous. However, rare lenses of more fossiliferous material may be exposed by fault scarps, particularly along the Garlock Fault north of California Route 58. This unit therefore has an undetermined paleontological sensitivity (PFYC Class 2).
- *Horned Toad Formation*: The Horned Toad Formation has yielded a diverse terrestrial vertebrate assemblage, known as the Warren Local Fauna, which includes antilocaprid, camelid, rhinoceros, horse, llama, the hyaena-like dog *Osteoborus*, the large cat *Machairodus*, and small mammal fossils. This unit has high paleontological sensitivity (PFYC Class 5a).
- *Older Tertiary Rhyolitic Felsite*: Paleontological resources do not survive the formation of intrusive igneous rock; therefore, this unit has a low paleontological sensitivity (PFYC Class 1).
- *Older Basement Rocks*: Paleontological resources do not survive the formation of igneous rock, and there are no marble pendants associated with granitic rocks in the project vicinity. This unit therefore has a low paleontological sensitivity (PFYC Class 1).

The potential for construction activities to impact significant paleontological resources is dependent on the type of activity and the paleontological sensitivity of each unit.

Excavations in geologic units of high sensitivity, such as the Horned Toad Formation, have a relatively high chance of encountering significant fossils, while excavations in geologic units of low sensitivity, such as intrusive igneous or igneous basement rocks, have little to no chance of encountering significant fossils. The impacts of excavation on paleontological resources can be mitigated by relocating the excavation, or by extracting the fossil(s). Because proper excavation and removal of paleontological resources does not lessen the scientific value of the resources, excavation is the recommended method of mitigation of paleontological resources in the project area.

Activities that do not involve excavations or other subsurface disturbance do not affect fossils buried in the sediment. Fossils not impacted by excavation are considered to be preserved; therefore paleontological resources are generally not impacted during the operation or maintenance of wind turbines. The mitigation measures below are applicable only to the construction phase of the project when adverse impacts are most probable.

4.3 Impacts By Construction Alternative

The geology in the project area is shown in Figure 1. The project is underlain by the high-sensitivity Horned Toad Formation, Quaternary alluvium of unknown sensitivity, low-sensitivity Holocene alluvium, Tertiary rhyolitic felsite, and older basement rock.

Excavations in the central portion of the site, and in other areas underlain by the Horned Toad Formation (shown in Figure 1), are very likely to disturb significant paleontological resources.

Transmission Line Alternatives

Three possible transmission line alternatives (shown in Figure 1) are also proposed for this project. They predominantly cross units similar to those which underlie the project, as shown in Figure 1.

Alternative A runs generally south from the project, crossing the high sensitivity Horned Toad Formation within the project area. The transmission line then extends south across Older Alluvium, turns west, and crosses Terrance Gravels; both of these units have low paleontological sensitivity. The final portion of the transmission line is underlain entirely by Holocene alluvium.

Alternatives B and C share a similar route. Both transmission lines cross Older Alluvium in the north, then extend to the south, crossing Alluvium. The northeastern portion of Alternative B also crosses the Horned Toad Formation. Paleontological sensitivity for both transmission lines generally decreases from the north (high-sensitivity Horned Toad Hills Formation) to the south (low-sensitivity Holocene alluvium).

4.4 Recommendations to Reduce Impacts

Inventory Paleontological Resources

A reconnaissance field survey and survey report is recommended for project areas underlain by high sensitivity Horned Toad Formation and undetermined sensitivity Older Quaternary Alluvium. The field survey would be a pedestrian survey intended to identify any surface evidence of fossils. Approval to conduct this survey would be obtained from BLM prior to field work.

Develop Paleontological Resource Monitoring and Mitigation Plan

After conducting the reconnaissance field survey, AWD will prepare and submit to the BLM and Kern County for approval a plan to mitigate any identified and/or potential subsurface impacts to paleontological resources. The Paleontological Resource Monitoring and Mitigation Plan (PRMMP) will identify construction impact areas where significant paleontological resources may be encountered and the depths at which those resources are likely to be discovered. The PRMMP will outline a coordination strategy to ensure that all construction disturbances in high sensitivity sediments will be monitored by paleontological monitors. The PRMMP will also detail the significance criteria to be used to determine which resources will be recovered for their data potential. The PRMMP will detail methods of recovery, post-excavation preparation and analysis of specimens, final curation of specimens at an accredited facility, data analysis, and reporting. The PRMMP will specify that all paleontological work undertaken by AWD on public land will be carried out by qualified professionals on a currently valid Paleontological Collecting Permit for the state of California. Notices to proceed will be issued following approval of the Paleontological Resource Monitoring and Mitigation Plan.

Monitor Construction for Paleontology

Based on the paleontological sensitivity assessment and PRMMP, AWD will conduct full-time construction monitoring in areas where and when sediments of high paleontological sensitivity will be disturbed.

Conduct Paleontological Data Recovery

If significant paleontological resources are discovered during excavation, treatment (including recovery, specimen preparation, data analysis, curation, and reporting) will be carried out by AWD, in accordance with the approved PRMMP.

Train Construction Personnel

All construction personnel working in sediments of high paleontological sensitivity will be trained regarding the recognition of possible buried paleontological resources and protection of all paleontological resources during construction, prior to the initiation of construction or ground-disturbing activities. Training will inform construction personnel of the procedures to be followed upon the discovery of paleontological materials. All personnel will be instructed that unauthorized collection or disturbance of federally protected fossils in the project area by AWD, their representatives, or employees will not be allowed.

4.5 Residual Impacts

Implementation of the above measures will result in impacts to paleontological resources that will be less than significant. In fact, recovery of fossil resources for scientific study is a beneficial effect by providing more scientific specimens and data.

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Appendix 3 Paleontology Literature and Records Review Results

25 May 2008

Dr. William
W. C. C. C.

State University of New York
College of Environmental Science and Forestry
Syracuse, NY 13210

PALEONTOLOGY LITERATURE AND RECORDS REVIEW - THE
STATE UNIVERSITY OF NEW YORK COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY
Syracuse, NY 13210

Dear Dr. C. C. C.

The University of New York College of Environmental Science and Forestry (ESF) is pleased to announce a new program of research and education in the field of paleontology. The program will focus on the study of the Earth's history and the evolution of life. The program will be led by Dr. C. C. C. and will include a number of courses and research projects. The program will be open to students who are interested in the study of the Earth's history and the evolution of life. The program will be open to students who are interested in the study of the Earth's history and the evolution of life. The program will be open to students who are interested in the study of the Earth's history and the evolution of life.

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Appendix 1 Paleontology Literature and Records Review Results

The program will be open to students who are interested in the study of the Earth's history and the evolution of life. The program will be open to students who are interested in the study of the Earth's history and the evolution of life. The program will be open to students who are interested in the study of the Earth's history and the evolution of life. The program will be open to students who are interested in the study of the Earth's history and the evolution of life. The program will be open to students who are interested in the study of the Earth's history and the evolution of life.

26 May 2009

CH2MHill

attn: W. Geof Spaulding, Ph.D.

Senior Scientist, Environmental Compliance

2285 Corporate Circle, Suite #200

Henderson, NV 89074

re: **PALEONTOLOGY LITERATURE AND RECORDS REVIEW, ALTA - OAK
CREEK MOJAVE WIND GENERATION PROJECT, FREMONT VALLEY
REGION, KERN COUNTY, CALIFORNIA**

Dear Dr. Spaulding,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a literature review and records search for the above-named study area in the Fremont Valley region of Kern County, California. The study area is located in portions of the following survey sections: section 2, Township 10 North, Range 13 West, San Bernardino Base and Meridian; sections 19, 20, 21, 22, 23, 27, 28, 29, 30, 31, 33, 34, and 35, T 11N, R 13W, SBB&M; and sections 6, 8, 10, 15, 16, 17, 20, 25, 27, 29, and 36, T 11N, R 14W, SBB&M. The study area covers portions of the following 7.5' United States Geological Survey topographic quadrangle maps: Conner SW, California (1955 edition, photorevised 1968 and 1973); Eagle Rest Peak, California (1942 edition); and Pleito Hills, California (1958 edition).

Previous geologic mapping (Smith, 1964) indicates that the proposed Ward subproperty is situated entirely upon surface and subsurface sediments of Pleistocene nonmarine alluvium (= unit **Qc**). These sediments have high potential to contain significant nonrenewable paleontologic resources, and so are assigned high paleontologic sensitivity. Similar sediments elsewhere throughout the western Mojave Desert have previously yielded significant paleontologic resources (Jefferson, 1991; Scott and Cox, 2008).

Mapping by Smith (1964) also indicates that the proposed CPC Proper subproperty is also located in part upon surface and subsurface Pleistocene nonmarine alluvium (= **Qc**), as well as upon pre-Cretaceous limestone outcrops (= **ls**), Mesozoic granitic rocks (= **gr**), Quaternary terrace deposits (= **Qt**), and Holocene (recent) alluvium (= **Qal**). As noted previously, the Pleistocene nonmarine alluvium has high paleontologic sensitivity; similarly, the Quaternary terrace deposits mapped in the southwestern portion of the property have potential to contain significant fossil resources, depending upon their lithology, and so are also assigned high paleontologic sensitivity. In contrast, the

Mesozoic rocks have no potential to contain fossil resources, and so are assigned low paleontologic sensitivity. Holocene alluvium present on the property is too geologically young to have potential to contain fossil resources, and so these sediments are also assigned low paleontologic sensitivity. However, it is important to note that Holocene alluvium may in some areas form a thin sedimentary veneer overlying older Pleistocene fossil-bearing sediments; where such subsurface sediments are present, they have high paleontologic sensitivity as discussed above.

Limestone rocks present within the boundaries of the CPC Proper subproperty may have high paleontologic sensitivity, based upon their lithology. In general, fossils preserved in marine limestone consist of marine invertebrates that are usually sufficiently abundant and widespread that they are not considered to have high paleontologic sensitivity. This does not imply that such resources are not scientifically significant; however, any paleontologically significant data lost to adverse impacts (be such impacts development-related or otherwise) can very likely be easily recovered from other exposures of the impacted formation which contained similar fossil density and species diversity. Monitoring of excavation in marine limestone outcrops present in the study area *for these marine fossils* is not therefore recommended.

However, depending upon the nature of the outcrops, there may also be potential to encounter fossil deposits that have accumulated in caves opened into the earlier limestone rocks. Such highly-significant fossil accumulations, most of which date to the later Pleistocene Epoch, have been previously reported from elsewhere in the Mojave Desert (Harrington, 1933; Harris, 1985; Goodwin and Reynolds, 1986; Reynolds and others, 1991a,b,c; Scott, 1997; Poinar and others, 1998; Rowland and Needham, 2003; Weinstock and others, 2005; Scott and Cox, 2008). These fossil accumulations, which are frequently of large size, exhibit significant species diversity, and trend towards preservation of microvertebrates, are cached in caves opened into the existing limestone. Such deposits, where present, have extremely high paleontologic sensitivity. For the purposes of this report, therefore, the limestone rocks present within the boundaries of the CPC Proper subproperty are assigned undetermined paleontologic sensitivity, pending determination of the potential for fissures or caves to be present in these rock outcrops.

In addition, there is also the possibility (again depending upon the nature of the limestone outcrops) that wood rat middens – that is, plant middens amassed through many years by wood rats (*Neotoma* sp.) – may be present as well within the area of potential effect. Middens of *Neotoma* have been known to accumulate through decades, centuries and even millennia as successive generations of packrats add collected plant matter to the midden. These middens can in some cases be paleontologic “treasure troves” in that they can provide:

- ◆ sequences of well-preserved plant fossils that enable reconstructions of past climatic conditions;
- ◆ potentially, time-stratified sequences of radiometric dates that enable more accurate interpretations of paleoenvironmental change through time; and

- ♦ occasionally, identifiable microfossil bones that permit comparisons with other, undated microfossil faunas to be advanced.

Wood rat middens have been previously employed to track climatic shifts and changes in plant distribution in the Great Basin and the Mojave Desert throughout the later part of the Pleistocene Epoch ($\pm 40,000$ years BP to $\pm 11,000$ years BP), as well as through much of the Holocene Epoch ($< 11,000$ years BP) (Van Devender, 1977; Van Devender and others, 1987; Spaulding and others, 1990; Spaulding, 1995). Such middens are therefore highly paleontologically sensitive. If encountered, such middens will need to be salvaged and studied in order to determine their age and potential paleontologic significance.

Mapping by Smith (1964) also indicates that the proposed CPC East subproperty is situated upon Holocene (recent) dune sands (= Qs) overlying undifferentiated Holocene alluvium (= Qal), as well as outcrops of Tertiary intrusive igneous rocks (= Ti). None of these units has potential to contain fossil resources; the Holocene sediments are not of sufficient geologic age to contain significant fossils, while the Tertiary igneous rocks have no potential to contain such resources. These geologic units are therefore assigned low paleontologic sensitivity. However, it is important to note again that Holocene alluvium mapped at the surface may in some areas form a thin sedimentary veneer overlying older Pleistocene fossil-bearing sediments. Where such subsurface sediments are present, they have high paleontologic sensitivity, as discussed previously.

For this review, I conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this search indicate that one previously-recorded paleontologic resource locality, SBCM 8.7.40, is situated within the boundaries of the CPC Proper study area. This locality yielded a fragment of heteromyid rodent from poorly-sorted pebbly sandstones and siltstones of presumed Pleistocene age. Data for this locality are appended. Additionally, locality SBCM 8.7.37 is situated within $\frac{1}{4}$ mile to the north of the Ward subproperty; this locality yielded fossil root casts from light brown sands of presumed Pleistocene age.

Recommendations

The results of the literature review and the search of the RPLI at the SBCM demonstrate that the proposed Alta - Oak Creek Mojave Wind Generation Project is located in part upon surface and subsurface Pleistocene sediments with high potential to contain paleontologic resources. Additionally, limestone rocks on the property may have high paleontologic sensitivity if fissures, cave deposits, or woodrat middens are present. A qualified vertebrate paleontologist must therefore develop a program to mitigate impacts to nonrenewable paleontologic resources. This mitigation program must be consistent with the provisions of the California Environmental Quality Act (Scott and Springer, 2003), as well as with regulations implemented by the County of Kern and with the proposed guidelines of the Society of Vertebrate Paleontology. This program should include, but not be limited to:

1. A paleontologic resource assessment in advance of excavation or development, including a field survey, to determine the paleontologic potential (if any) of limestone outcrops present within the boundaries of the study area, as well as to locate and recover any significant fossil resources exposed at the surface.
2. Monitoring of excavation into rock units having high potential to contain significant nonrenewable paleontologic resources. Based upon the results of this review, areas of concern would include any and all previously-undisturbed sediments of Pleistocene age present within the boundaries of the property. Limestone outcrops may also require field monitoring and mitigation, depending upon the results of the pre-excavation survey. Paleontologic monitors should be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens.
3. Preparation of all recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils are essential in order to fully mitigate adverse impacts to the resources (Scott and others, 2004).
4. Identification and curation of specimens into an established, accredited museum repository with permanent retrievable paleontologic storage (e.g., SBCM). These procedures are also essential steps in effective paleontologic mitigation (Scott and others, 2004) and CEQA compliance (Scott and Springer, 2003). The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not considered complete until such curation into an established museum repository has been fully completed and documented.
5. Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into an established, accredited museum repository, would signify completion of the program to mitigate impacts to paleontologic resources.

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Please do not hesitate to contact us with any further questions you may have.

Sincerely,

Eric Scott, Curator of Paleontology
Division of Geological Sciences
San Bernardino County Museum

SAN BERNARDINO COUNTY MUSEUM REGIONAL PALEONTOLOGIC LOCALITY INVENTORY

SBCM: 8.7.40 PROJECT: WYCAL

Name: Cameron Canyon

Area: Tehachapi Valley

County: Kern County

State: California

District:

USGS Map: Monolith, CA; 7.5' 1966 PR 1973

Utm Zone: 11	Utm Datum: NAD1927	Meters East: 376840	Meters North: 3879950
	Elevation Feet: .	Elevation Meters: .	
Utm Zone: 11	Utm Datum: NAD1927	Meters East: 376990	Meters North: 3879930
	Elevation Feet: .	Elevation Meters: .	
Utm Zone: 11	Utm Datum: NAD1927	Meters East: 376880	Meters North: 3879900
	Elevation Feet: 4280.	Elevation Meters: 1304.54	
Utm Zone: 11	Utm Datum: NAD1927	Meters East: 376990	Meters North: 3879880
	Elevation Feet: .	Elevation Meters: .	

PM: San Bernardino Meridian T 11N R 14W Sections: 10 CENTER OF SE4

Field Number: HW 1029-17

Other Number:

Repository: SBCM

Collector: Hugh Wagner

Description: poorly sorted pebbly siltstones and sandstones

Formation:

Unit/Member:

Geologic Age: Pleistocene

Data Entry: S 02/11/1992

Taxa/Object Found:

Notes:

Appendix Q

Cultural Resources Report

Prepared for
Alta Windpower Development, LLC

1400 H Street, Suite 120
San Diego, CA 92101

September 2010

Prepared by:

Nashia Lawton, M.A., SFA, Gabriela Cardenas, M.A., SFA,
Chad Helton, M.A., SFA

 Cultural Resources, LLC

1400 H Street, Suite 120
San Diego, CA 92101

Cultural Resources Inventory Report for the Alta East Wind Project, Kern County, California

Prepared for
Alta Windpower Development, LLC
11682 El Camino Real Suite 320
San Diego, CA 92130

September 2010

Prepared by:
**Natalie Lawson, M.A., RPA; Gloriella Cardenas, M.A., RPA;
Clint Helton, M.A., RPA**



CH2MHILL

6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707

Cultural Resources Inventory Report for the Alta East Wind Project, Kern County, California

Report Prepared For:

**Alta Windpower Development, LLC
11682 El Camino Real Suite 320
San Diego, CA 92130**

Prepared by:

**Natalie Lawson, M.A., RPA; Gloriella Cardenas, M.A., RPA;
Clint Helton, M.A, RPA
CH2M HILL
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707**

September 2010

National Archaeological Database (NADB)

Type of Study: Literature Search, Survey, and Evaluation

Sites Recorded/Updated: P-15-321; -1703; Temporary Site Nos. S-1, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -15

Isolates Recorded: 45 new isolates

USGS Quadrangle: Monolith, CA; Mojave, CA

Acreage: 1417 acres

Level of Investigation: Section 106

Key Words: Tehachapi; Mojave; Tehachapi Pass; Tehachapi Mountains; Mojave Desert; Alta East; Section 106; CEQA; Isolate; Positive Survey; Los Angeles Aqueduct; Atchison, Topeka, and Santa Fe Railway; Southern Pacific Railroad; prehistoric site; historic site

Management Summary

CH2M HILL completed a cultural resources inventory of an approximately 1,400-acre area in support of the proposed development of the Alta East Wind Project site in Kern County, California. The Alta East Wind Project is being proposed by Alta Windpower Development, LLC. The Alta East project is located on public lands administered by the U.S. Bureau of Land Management (BLM) and privately-owned lands under the jurisdiction of Kern County, west of the unincorporated town of Mojave and south-southeast of the City of Tehachapi.

This study was conducted under CH2M HILL's California State BLM Cultural Resources Use Permit No. CA-07-17 and BLM Ridgecrest Field Office Fieldwork Authorization executed on August 11, 2009. The purpose of the survey was to determine the presence of historic properties within the area of potential effects (APE), pursuant to Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800).

This assessment includes a review of previous studies and the results of a systematic pedestrian surface survey. The archival research and field work were completed in March, May, and August of 2010. The purpose of the survey was to determine the presence of historic properties within the APE where the Alta East project is proposed. "Historic property" is a Section 106 term referring to a resource eligible for or listed on the National Register of Historic Places (NRHP) and generally older than 50 years of age by definition. However, the resource can be less than 50 years of age.

A literature search was conducted by staff of the Southern San Joaquin Valley Information Center (SSJVIC), located at the California State University, Bakersfield, in Bakersfield, California, on March 15, 2010. A total of 18 previous cultural resource studies have been conducted within the proposed APE.

A systematic Class III cultural resources survey was conducted on May 11 through May 28, 2010 by CH2M HILL. A total of 15 archaeological sites and 45 isolated artifacts were documented within the survey area. Site recordation was completed on August 18 and 19, 2010. None of these archaeological resources have been determined as eligible or potentially eligible resources. No further work is recommended.

If human remains are discovered, Archaeologist Donald Storm in BLM Ridgecrest Field Office at (760) 384-5422 and the Kern County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the Coroner is responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The NAHC, pursuant to Section 5097.98, will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal.

A copy of this report will be filed with the Ridgecrest BLM office and the SSJVIC of the California Historical Resources Information System (CHRIS) located at California State University, Bakersfield (CSUB).

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Appendices

A	Table of Sites and Isolates of the Alta East Survey Area
B	Project Photos
C	Survey Results Map (Confidential)
D	Department of Parks and Recreation Forms (Confidential)

Acronyms and Abbreviations

AMSL	above mean sea level
APE	area of potential effects
AWD	Alta Windpower Development, LLC
BLM	Bureau of Land Management
B.P.	before present
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
CSUB	California State University, Bakersfield
DPR	California Department of Parks and Recreation
ft	foot/feet
GPS	global positioning system
IO	isolated occurrence
m	meter
MW	megawatts
NADB	National Archaeological Database
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHP	California Office of Historic Preservation
PRC	California Public Resources Code
SHPO	State Historic Preservation Office
SPRR	Southern Pacific Railroad
SR	State Route
SSJVIC	Southern San Joaquin Valley Information Center
USGS	U. S. Geological Service

1.0 Introduction

CH2M HILL was contracted by Alta Windpower Development, LLC (AWD) to complete a cultural resource assessment for the Alta East Wind Project (Alta East project, or the project), a proposed wind energy development, in Kern County, California. The project will be constructed on approximately 3,660 acres of land. The permanent footprint will consist of up to 120 wind turbines, as well as substations, transmission lines, access roads, buildings, parking areas, and ancillary facilities. The project's temporary facilities will include construction access roads, lay-down areas, and concrete batch plants.

The Alta East project is located on both private and federal lands. Within the project area, the federal lands are under the jurisdiction of the U.S. Bureau of Land Management (BLM) and private lands are under Kern County jurisdiction. Therefore, the project includes a federal undertaking, and the assessment of the entire project was completed to address the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations 36 Code of Federal Regulations (CFR) Part 800. The study was also conducted in compliance with Section 5024.1 of the California Public Resources Code (PRC) to identify the archaeological or historical resources in the area of potential effects (APE).

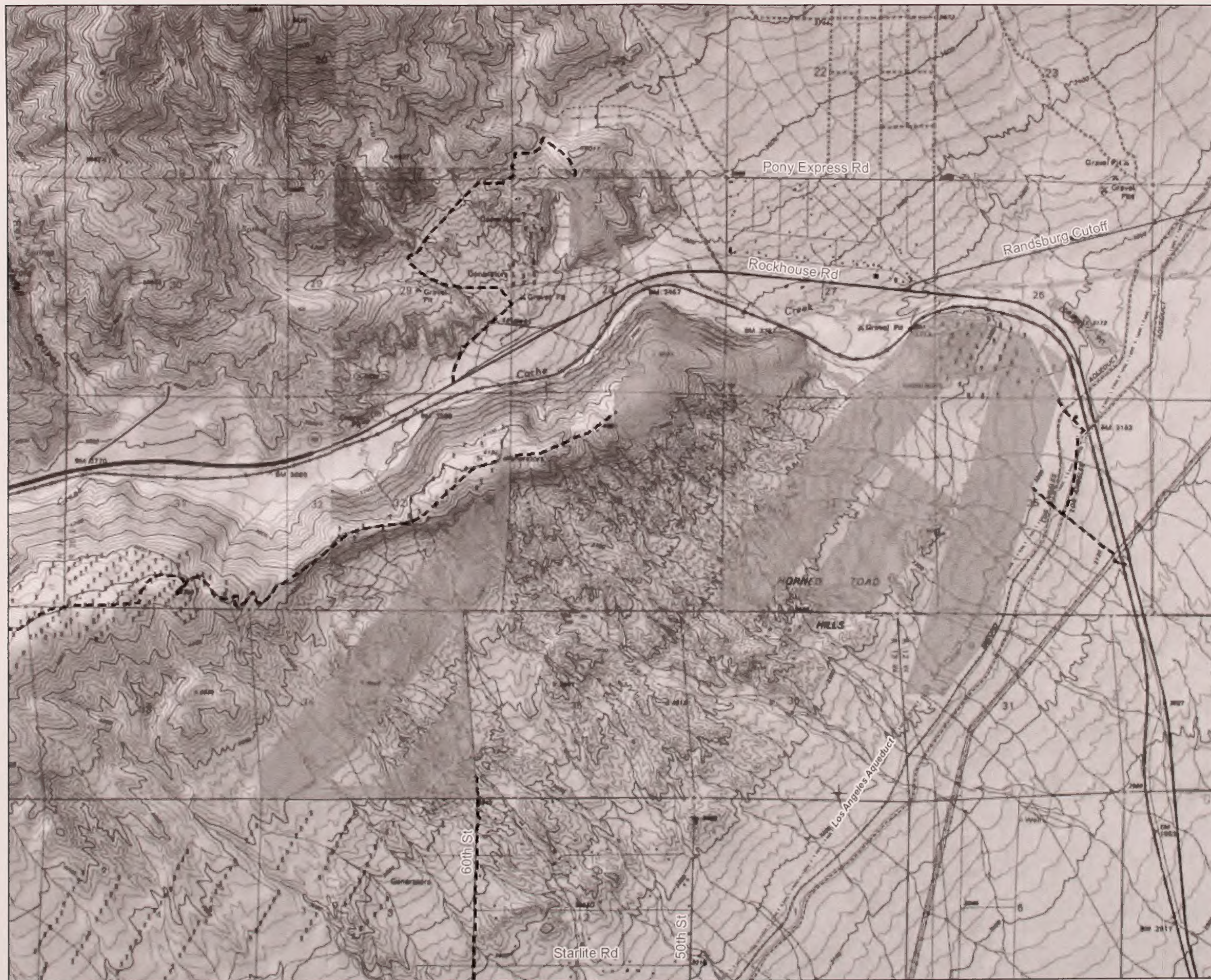
This study was conducted under CH2M HILL's California State BLM Cultural Resources Use Permit No. CA-07-17 and BLM Ridgecrest Field Office Fieldwork Authorization executed on August 11, 2009. The purpose of the survey was to determine the presence of historic properties within the APE, pursuant to Section 106 of the NHPA (36 CFR 800), and pursuant to the California Environmental Quality Act (CEQA) (PRC 21000 et. seq.).

The project area is approximately 3 miles northwest of Mojave, a Census Designated Population, and approximately 11 miles east of the City of Tehachapi in southern Kern County, California. The Alta East project is located west of State Route 14 (SR 14) and south of SR 58, near the junction of SR 14 and SR 58. Specifically, the Alta East project is located in Township 11 North, Range 12 West, Section 31; Township 12 North, Range 13 West, Sections 34 and 35, San Bernardino Base Meridian and Township 32 South Range 35 East, Sections 26-28 and 32-35 of the 1973 *Mojave, California 7.5'* and the 1995 *Monolith, California 7.5'* U.S. Geologic Survey (USGS) quadrangle maps. This cultural resources assessment focuses on areas of proposed disturbance, referred to here as the cultural resources survey area (survey area), which consists of approximately 1,400 acres (Figure 1).

This report contains several appendices. Appendix A contains a table of sites and isolates recorded in the survey area. Appendix B contains representative project photos. Confidential Appendix C contains maps depicting the area surveyed. Confidential Appendix D contains all California Department of Parks and Recreation (DPR) forms.

Project personnel included Principal Investigator Clint Helton, M.A., RPA and Field Director Natalie Lawson, M.A., RPA, who meet the Professional Qualification Standards stated in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and is the Principal Investigator for CH2M HILL's California State

BLM Cultural Resources Use Permit No. CA-07-17. Field personnel included Ryan Rolston, John McDermott, Jessie Shelmire, and Ken Hazlett. Gloriella Cardenas, M.A., RPA assisted with report writing.



LEGEND
 Survey Area

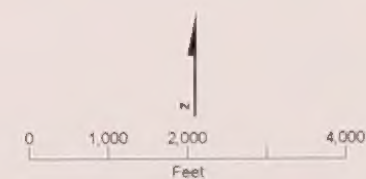


FIGURE 1
Cultural Resources Survey Area
 Alta East Wind Project
 Alta Wind Energy Center Project

2.0 Environmental Setting

2.1 Natural Setting

The Alta East project is located in a transition area where the Mojave Desert lies adjacent to the Tehachapi Mountains, one of southern California's Transverse Ranges, which connect the Coast Ranges on the west to the southern end of the Sierra Nevada Mountains on the east. This range separates the Mojave Desert from the southernmost end of the Great Central Valley. The Alta East project, situated at elevations between 3,000 and 4,000 feet (ft) above mean sea level (AMSL), is located near unincorporated Mojave, California.

Precipitation within the Alta East project averages about 10 inches annually. Rain typically falls in the desert climate of the project in winter, although the summer monsoons can bring rain as well. Snow occurs at the higher elevations. Southwest winds regularly blow through the area, funneled through Oak Creek and Tehachapi Passes, which connect the San Joaquin Valley to the Mojave Desert through the Tehachapi Mountains. In the fall, a reversal of wind direction, Santa Ana conditions, frequently occurs.

Deposition within the Alta East project consists of older Plio-Pleistocene alluvium, and recent Holocene alluvium. A large part of the project area is located within the extensive alluvial fans which extend south and east from the Tehachapi Mountains. Alluvial deposition occurs within some of the Alta East project within the Tehachapi Mountains as well. Plutonic rocks, including quartz monzonite, granodiorites, and tonalites, and igneous rocks, such as basalts, andesites, and rhyolites, occur within the Alta East project (Dibblee, 1967). Prehistoric people utilized these materials for both groundstone and flaked stone.

2.1.1 Biology

The project area is located within a transition area represented by several native biotic communities, including the Joshua Tree Woodland, the Chaparral, the Pinyon-Juniper, and the Riparian Woodland Communities.

2.1.2 Current Land Use

The Alta East project is located within a rural area characterized primarily by open space and wind farms. The survey area is comprised predominately of undeveloped land. Much of the Alta East project is dotted with off-road vehicle trails and small modern campsites. A wind farm was previously located within the northeast corner of the survey area; all but one turbine was removed and only footings remain. Other land use includes sheep grazing, gold mining, and recreational hunting. Underground gas lines, the Southern California Edison Antelope Transmission Line, several smaller transmission lines, the first and second Los Angeles Aqueducts, as well as several roads, both paved and dirt, cross through the project vicinity. The majority of these linear features are currently in use.

2.1.3 Cultural Context

The Alta East project is located in a transition area where the Mojave Desert meets the Tehachapi Mountains and includes a variety of landscapes. Archaeological sites in this area are generally included in the Mojave Desert chronologies as the people in the area appear to have moved from the deserts into the mountains depending upon the season, and artifact assemblages from archaeological sites in this area most closely resemble those recorded in the Mojave Desert.

Generally, cultural developments in southern California have occurred gradually and have shown long-term stability, making the synthesis of chronologies and applying them to specific locales problematic. Of the many chronological sequences proposed for southern California, two primary regional syntheses have been commonly used for the southern California deserts: Wallace (1955, 1978) and Warren (1968, 1984). The first, advanced by Wallace in 1955 and then refined in 1978, uses major cultural developments to define four cultural horizons, each with characteristic local variations: Early Period (Early Man Horizon), Milling Stone, Intermediate, and Late Period. In 1962, Wallace modified this chronology specifically for the high deserts of southern California (Wallace, 1962). Warren (1968, 1984) defines five periods in southern California prehistory: Lake Mojave, Pinto, Gypsum, Saratoga Springs, and Protohistoric. In 2007, however, a new synthesis of cultural prehistory in the Mojave was presented by Sutton et al. (2007), which includes results from 20 years of extensive fieldwork conducted in the Mojave Desert by various individuals and groups. Sutton et al. (2007) divide the Mojave Desert prehistory into four periods: Pleistocene, Early Holocene, Middle Holocene, and Late Holocene. Each period is further subdivided into complexes generally based on Warren (1984). Although the discussion below includes Wallace's work as well as Warren's chronology, it is based largely on the new work conducted post-1984 and a relatively newly proposed chronology (Sutton et al., 2007). See Table 1 for a brief comparison of these three chronologies.

Neither Warren's nor Wallace's chronologies mentioned above begin prior to Terminal Pleistocene ca. 12,000 before present (B.P.). More sites in North and South America are beginning to be accepted as dating to earlier times, and although the Sutton et al. chronology acknowledges this fact by the inclusion of the hypothetical Pre-Clovis Complex, no sites from this period are currently documented in the Mojave Desert. A small fraction of the archaeological community has proposed Pre-Clovis sites within the Mojave Desert, but much of these data remain currently unpublished and not substantiated (Sutton et al., 2007).

2.2 Paleo-Indian Period (10,000 to 8,000 cal B.C.)

The Paleo-Indian Period covers the interval from the first accepted presence of humans in southern California in the late Pleistocene until approximately 8,000 cal B.C.¹ Artifacts and cultural activities from this period represent a predominantly hunting culture; diagnostic artifacts include extremely large, often fluted bifaces associated with use of the spear and the atlatl. Populations appeared to have been relatively small and highly mobile, living in temporary camps near readily available water. Evidence for Clovis occupation in the Mojave Desert is currently limited to scattered isolated points and a single site at Lake

¹ The term "cal B.C." refers to a calibrated radiocarbon date.

China which is presumed to be an occupation site (Sutton et al., 2007). In the vicinity of the Alta East project, a single Clovis-like point fragment was found in the Tehachapi Mountains (Moratto, 1984).

TABLE 1
Cultural Chronologies Proposed for the Mojave Desert

Approximate Date	Sutton et al. (2007)		Warren (1984)	Wallace (1962)	Associated Artifacts
	Temporal Period	Cultural Complex	Cultural Period	Cultural Horizons	
Up to 10,000 B.C.	Pleistocene	Pre-Clovis (Hypothetical)			Unknown
10,000-8,000 B.C.		Paleo-Indian	Clovis	Early Man	Fluted points
8,000-6,000 B.C.	Early Holocene	Lake Mojave	Lake Mojave	Milling Stone	Stemmed points
7,000-3,000 B.C.	Middle Holocene	Pinto	Pinto		Pinto points
		Deadman Lake (currently 29 Palms only)			Contracting stem and leaf shaped points
2,000 B.C. to A.D. 200	Late Holocene	Gypsum	Gypsum	Intermediate	Gypsum and Elko Series points
A.D. 200-1,100		Rose Spring	Saratoga Springs		Rose Spring and Eastgate Series points
A.D. 1,100-Contact			Late Prehistoric	Protohistoric	Late Prehistoric

2.3 Lake Mojave Complex (8,000 to 6,000 cal B.C.)

In the deserts of southern California, the earliest substantive remains of human occupation are found along the shoreline of ancient Lake Mohave in the Mojave Desert of San Bernardino County. The Lake Mojave Period (approximately 8,000 to 6,000 cal B.C.) is associated with now-dry pluvial lakes found throughout the Mojave Desert. Artifacts observed at Lake Mohave Period sites include stylized dart points of the Lake Mohave and Silver Lake series, well-made bifacial knives and other cutting tools, large domed scrapers or scraping planes, crescents, occasional cobble core tools, and ground stone implements (Wallace, 1962; Sutton et al., 2007). Flaked stone artifacts, which make up the largest part of the toolkit, are often formal tools made of non-local materials, while ground stone tools, present in far smaller numbers, generally show ephemeral wear, thus suggesting long-term curation of more easily ported items and less reliance on floral resources. Site types include extensive habitation sites, small camps, and workshops (Sutton et al., 2007). In addition to sites known in the Lake Mohave area, a goodly density of Lake Mojave Period artifact

assemblages are known at Fort Irwin, Twenty-nine Palms, Lake China, and in the vicinity of the Alta East project, at Lake Rosamond.

2.4 Pinto Complex (7,000 to 3,000 cal B.C.)

The Pinto Complex is the mostly widely distributed of the early complexes in the Mojave Desert and occurs in a wide variety of topographic and environmental zones, including near remnant pluvial lake basins, near fossil stream channels, close to springs or seeps, as well as in upland areas. Large Pinto Complex sites with deep middens and a wide range of artifact types appear to correlate with stable water sources. In some parts of the Mojave Desert, a temporal overlap is noted between the Lake Mojave Complex and the Pinto Complex. Recent radiocarbon dates from Fort Irwin, Twenty-nine Palms, and the Garlock Fault site in Kern County range from 8,340 B.C. to 6,300 B.C., indicating the development of the Pinto Complex in the early Holocene and corresponding to the end of the Lake Mojave Complex. There appears to be good continuity of flaked stone technologies from one complex to the next, including the material selection of locally available stone as well as use of bifacial and unifacial tool forms. The main distinction between the two periods appears to be the number of ground stone tools found at Pinto sites in comparison to the relative paucity of ground stone tools found at Lake Mojave sites. High levels of ground stone found at Pinto sites indicates that the emergence of intensive plant exploitation began by approximately 7,000 cal B.C., before the Altithermal, as previously proposed (Sutton et al., 2007).

Pinto sites are found in a wide range of environments and the flourishing of new economies, including greater plant exploitation, is seen both in the desert as well as on the coast during the Pinto Complex. *Olivella* shell beads have been found with Pinto sites, indicating the beginnings of trade with the coast. Diagnostic artifacts recovered from Pinto Period archaeological sites include heavy keeled scrapers, flat milling stones, manos, and Pinto series projectile points, which are large, coarsely made points, indicating the continued use of darts and atlatls (Warren, 1984). By the end of the middle Holocene, conditions in the Mojave Desert became much hotter and much drier. Currently, few sites are known to date to the period between 3,000 and 2,000 cal. B.C. and it appears that parts of the Mojave may have been abandoned (Sutton et al., 2007).

2.5 Gypsum Complex (2,000 cal B.C. to A.D. 200)

The start of the Gypsum Complex coincides with the beginning of the Little Pluvial at approximately 4,000 B.P. and continues into the dry period following the Little Pluvial. Despite the paucity of sites dating to this period, the first good evidence for contact between the desert and the coast dates to the Gypsum Period, and Southwestern influence in the California deserts is observed as well (Warren, 1984; Sutton et al., 2007). *Olivella* shell beads and *Haliotis* rings from the coast and split twig figures from the Southwest are found at Gypsum sites. Gypsum Complex toolkits include the diagnostic Elko and Elko eared points, leaf-shaped points, rectangular based knives, flake scrapers, T-shaped drills, the occasional large scraper plane, and hammerstones. Elko series points are generally associated with the spread of Uto-Aztecan speakers throughout the Mojave during this period (Moratto, 1984). A shift in food procurement strategies marks this period. Grinding implements, including

manos and milling stones, became common and mortars and pestles were introduced (Warren, 1984).

People living in the deserts had adapted to the more arid conditions of the southern California deserts by the end of the Gypsum Complex. New procurement strategies and regular trade contact with peoples living on the coast provided stability to desert dwellers, and despite the return to a warmer drier climate at the end of the Little Pluvial, populations did not decrease in the deserts at the end of the Gypsum Complex as they had at the end of the Pinto Complex (Sutton et al., 2007). It is possible, based on linguistic evidence, that the Takic branch of the Uto Aztecan language spread into the Tehachapi Mountains at the end of the Gypsum Complex (Moratto, 1984). Another model proposes that during the warmer and drier Gypsum Complex, populations based themselves in the Sierra Nevada and Tehachapi Mountains and used the desert only on an ephemeral basis (Sutton et al., 2007).

2.6 Rose Spring Complex (A.D. 200 to 1100)

During this period, a strong coastal influence extends into the western Mojave Desert and Antelope Valley (Warren, 1984). The bow and arrow moved into the western Mojave Desert at this time. Evidence for a significant population increase and rather dramatic changes in artifact assemblages characterize the Rose Spring Complex in the western Mojave (Sutton et al., 2007). Within the Antelope Valley, several large village sites with cemeteries and deep middens are recorded. Generally, the Rose Spring Complex appears to be in strong continuity with the Gypsum Complex. Similar artifacts, such as milling stones, manos, mortars, pestles, and incised stones are still used. Desert populations continued a successful hunting and gathering adaptation to the desert environment through increasingly complex subsistence strategies, including the development of the bow and arrow. These sites contain a variety of trade items, including southern California shell beads, steatite items, and other coastal artifacts. Eastgate and Rose Spring projectile points are the diagnostic artifacts (Sutton et al., 2007). Ceramics were not widely used in the western Mojave and Antelope Valley during this period, and the lack of pottery at the large villages in the region could indicate a negligible Hakataya influence (Warren, 1984). A high frequency of obsidian at Rose Spring sites, particularly a high frequency of specifically Coso obsidian, indicates either active trade between populations in the western Mojave and populations near the Coso source or frequent travel between the Coso source and the western Mojave (Sutton et al., 2007).

Rose Spring sites are found near springs, washes, and occasionally lakeshores. Architectural evidence of pit houses, wickiups, and other types of structures indicate an increase in sedentism during this period; however, the Medieval Climatic Anomaly began during the Rose Springs Complex. The resulting desiccation of lakes and other water sources in the western Mojave Desert appears to have significantly changed settlement patterns, resulting in a shift in dependence upon permanent water sources to more ephemeral ones. The Rose Springs Complex ended by about A.D. 1100.

2.7 Late Prehistoric Complexes (A.D. 1100 to Historic Times)

During this period, there was a strong reliance on plant food gathering and hunting of small game, and a decreased reliance on large game (Warren 1984). Separate complexes emerged which appear to represent the ethnographic groups. Anasazi turquoise mining, Hakatayan influence from the Colorado River, and the spread of the Numic Paiute and Shoshone culture spread east from the western Mojave Desert. Seasonal movement was common and resulted in a diverse array of site types. For the populations in the western Mojave and Antelope Valley, large village sites remain marked by a paucity of pottery. Characteristic artifacts include Desert series and Cottonwood projectile points, buffware and brownware ceramics, shell and steatite beads, and milling tools. Trade continues to develop and expand with groups on the coast. Late during the Late Prehistoric Complex, there appears to be an abandonment of large village sites in the Antelope Valley.

The Alta East project is located in a border area occupied by the Kawaiisu and the Kitanemuk (see Figure 2). These two groups are discussed below.

Kawaiisu. According to Kroeber (1925), the Kawaiisu are a relatively recent off-shoot of the Chemehuevi and part of the Shoshonean language group, and thus of the Uto-Aztecan family group. Kawaiisu speech was Ute-Chemehuevi and most closely related to Chemehuevi (Moratto, 1984). Their main areas of occupation were the southern Sierra Nevada, Tehachapi, and Piute Mountains (Zigmund, 1986). Father Garces wrote about Kawaiisu living in the areas of Walker Pass and Tehachapi in 1776 (Kroeber, 1925). Harrington (1942) reported that according to a Kitanemuk consultant, Pedro Cuhueve, at one time a Kawaiisu Rancheria existed in the location of present day Tehachapi. As the Sierra Nevada Mountains are often considered the division between Great Basin cultures and California cultures, the Kawaiisu, living on that border, exhibited traits of both groups (Zigmund, 1986).

Although the Kawaiisu lived primarily in the foothills and mountains, they would travel to lower elevations during the cooler seasons. Kawaiisu winter structures were made of willow and tule on a wooden frame with a center smoke hole. Tule mats were used as doors. Sweathouses were earth covered; during the summer, a shade house was constructed for food preparation activities (Zigmund, 1986). The Kawaiisu lived in chieftonships, which were generally based on familial ties. Kawaiisu chiefs did not inherit the role of chief; rather any rich Kawaiisu man might become a village chief. A son might succeed his father as chief, if he gained enough property on his own, as a man's property was destroyed at his funeral. Jimson weed was employed for religious and shamanistic purposes as well as puberty rites among the Kawaiisu, much as it was throughout southern California. The Kawaiisu shamans practiced rain magic, and rain doctors would minister to the sick as well as summon the rain.

Kawaiisu subsistence was based on hunting, fishing, and gathering. Acorns were one of their staple crops. Pinon nuts could be gathered at higher elevations of Kawaiisu territory. Seeds, shoots, leaves, bulbs, tubers, and berries were collected as well. Large game, including deer, bear, mountain sheep, and antelope, was hunted, as was smaller game including squirrels, mice, and rabbits. The Kawaiisu would join the nearby Tubatulabal and Yokuts in communal antelope drives in the San Joaquin Valley (Smith, 1978). The Kawaiisu

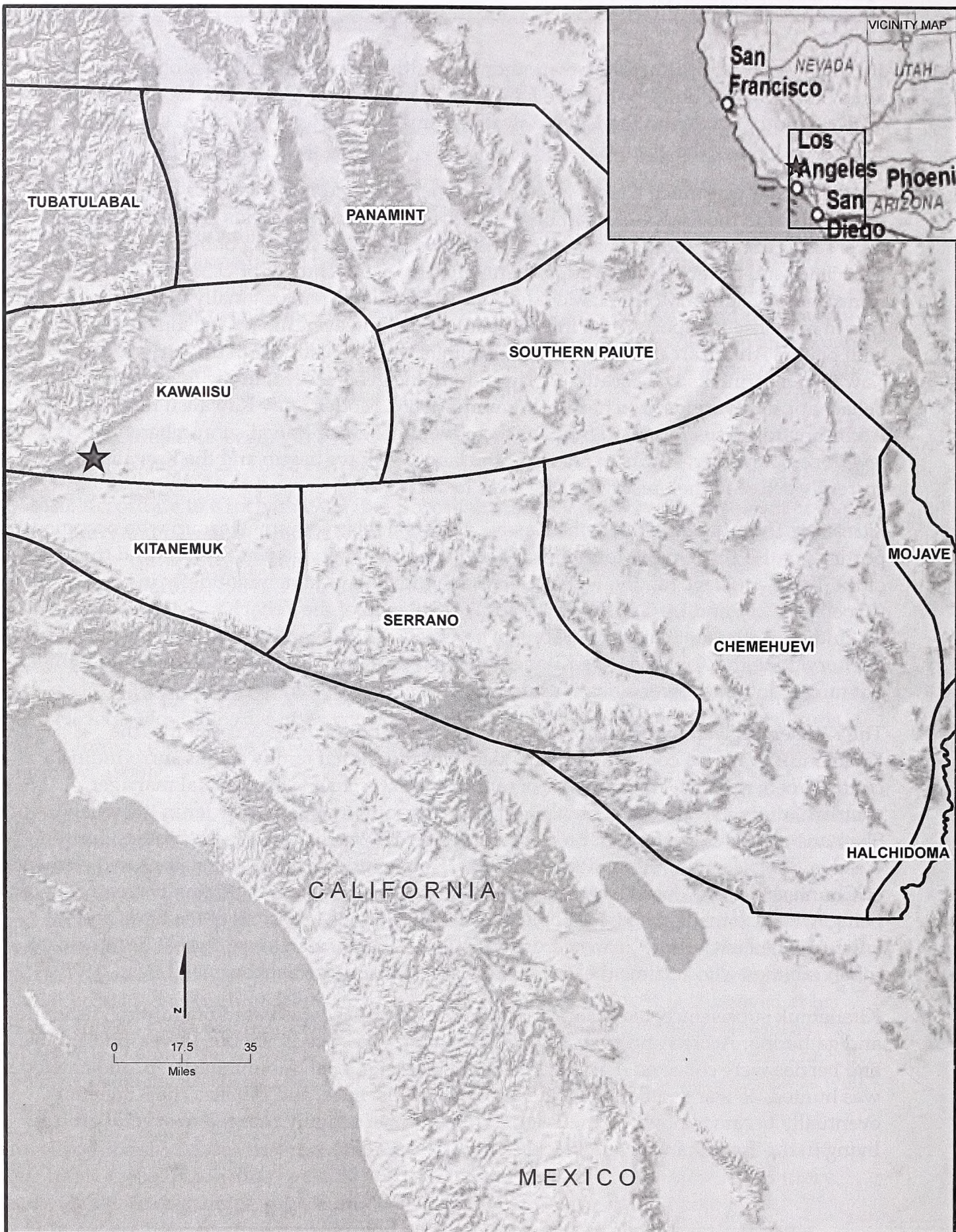
did not practice agriculture; however, they did cultivate tobacco and possibly practiced some burying of dry brush to fuel the following year's growth (Zigmund, 1986). Acorns, nuts, seeds, and other gathered foods were stored in small granaries which were constructed two or more feet above the ground.

Kawaiisu land was much sought after during the 1800s and into the 1900s by the influx of Americans into the area. Gold had been discovered in Kawaiisu lands and mining claims covered the area. In 1863, 35 unarmed Native Americans, consisting of individuals from Tehachapi and Owens River groups, were killed by a detachment of U.S. soldiers under the command of Captain Moses A. McLaughlin. The soldiers were originally dispatched to the area in response to reports of an intertribal meeting; however, most residents in the area, both Native American and white, felt the killings were unjustified. In the early 1900s, Kawaiisu informants were scattered throughout the general area, living in Monolith, Tehachapi, and various Rancherias (Zigmund, 1986). Modern-day Kawaiisu reside in Tejon. According to census results from 1980, native speakers of Kawaiisu numbered less than a few dozen; however, efforts to resurrect the language have begun and the Kawaiisu are currently active in the preservation of their history.

Kitanemuk. The Kitanemuk, like the Kawaiisu, were a relatively small group who occupied portions of the Tehachapi Mountains. The Kitanemuk language was Serrano and thus part of the Takic language family. Father Garces mentions the Kitanemuk briefly in his record (Kroeber, 1925), and Lt. G.M. Wheeler's 1876-1879 map of the Tehachapi Mountains shows an "Indian Settlement" along the Comanche Creek, which would have been in Kitanemuk territory. Like the Kawaiisu, the Kitanemuk lived primarily in the mountains and foothills, but ranged into the lower elevations during the fall and winter.

The Kitanemuk were patrilineally organized. Garces noted in his account that the Kitanemuk lived in a communal tule house with individual family rooms surrounding a court (Kroeber, 1925). Villages were organized under a chief, a ceremonial manager, shamans, diviners, and other ritualists. This elite group maintained order in the village. Shamans treated major illness, brought rain, and performed at major ceremonies. Jimson weed and tobacco figured in different rituals. Kitanemuk mythology encompassed elements of Chumash, Yokuts, and Gabrielino mythology. The universe was originally created by one being, who also made the First People, which included the ancestors of the birds and animals. The First People drowned or were turned to animals during a great flood, except for six siblings who became the ancestors of the Kitanemuk (Blackburn and Bean, 1978).

Kitanemuk subsistence, like their neighbors, the Kawaiisu, was based on hunting, fishing, and gathering. Acorns and pinon nuts were staple crops. Seeds, shoots, leaves, bulbs, tubers, and berries were collected. Large game, including deer, bear, mountain sheep, and antelope was hunted, as was smaller game including squirrels, mice, and rabbits. The Kitanemuk eventually became known as the Tejon Indians, which actually referred to several groups living in the Tejon Ranch area (Blackburn and Bean, 1978).



LEGEND

★ Project Location

□ Ethnographic Groups

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

Source: Sutton et al. 2007

FIGURE 2
Ethnographic Distribution in the
Mojave Desert and Project Vicinity
Alta East Wind Project
Alta Wind Energy Center Project

2.8 Historic Era (1769 AD – present)

In 1542, Juan Rodriguez Cabrillo explored the California coast by ship, entering San Diego Bay and claiming Alta California for Spain. Sixty years later, Sebastian Vizcaino sailed into the San Diego Bay. Exploration of the land was slower to come. Don Gaspar de Portola searched Alta California for suitable mission sites in 1769. Captain Juan Bautista de Anza traveled a desert route to the Mission San Gabriel Arcangel from Mexico in 1774.

In California, the historic era is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

Spanish/Mission Period. The historic period in California began with the establishment of Spanish Colonial military outposts, the first of which was Mission San Diego de Alcalá, built in 1769. The 1770s saw a number of expeditions and surveys travel across the desert areas of southern California. In 1772, Pedro Fages led a group across the western Mojave Desert while pursuing deserters from the San Diego Presidio (Beattie and Beattie, 1939). Fages appears to have traveled as far north as Willow Springs, near the Alta East project, but his accounts do not indicate he traveled into the Alta East project vicinity (Boyd et al., 1982). The first European to traverse the Alta East project site, however, appears to have been Father Francisco Garces in 1776, more than two hundred years after Cabrillo sailed the coast (Barras, 1976). Garces crossed the Tehachapi Mountains traveling north into the San Joaquin Valley, crossing through Oak Creek Pass.

Rancho Period. The Decree of Secularization, passed in 1834, ended the Mission Period in California. The ranchos of San Bernardino and San Geronio were abandoned. The following years were marked by the proliferation of cattle ranching throughout the region, as the Mexican Governor granted vast tracts of land to Mexican (and some American) settlers. The mission lands were then opened for grants by the Mexican government to citizens who would colonize the area and develop the land, generally for grazing cattle and sheep (Lech, 2004). The Alta East project was not located within the boundaries of any rancho.

Although trappers and explorers, including Jedediah Strong Smith, Ewing Young, and Kit Carson, traversed the Tehachapi Mountains in the early 1800s, the Alta East project and vicinity were not well explored until the American influx of the mid-1800s (Barras, 1976).

American Period. Following the signing of the Treaty of Guadalupe Hidalgo in 1848, the United States took possession of California. The treaty bound the United States to honor the legitimate land claims of Mexican citizens residing in captured territories. The Land Act of 1851 established a board of Land Commissioners to review these records and adjudicate claims, and charged the Surveyor General with surveying confirmed land grants. In order to investigate and confirm titles of California, American officials acquired the provincial records of the Spanish and Mexican governments that were located in Monterey. Those records, most of which were transferred to the U.S. Surveyor General's Office in San Francisco, included land deeds and sketch maps (Gutierrez and Orsi., 1998).

From 1852 to 1856, a board of Land Commissioners determined the validity of grant claims. The commissioners rejected many of the original land claims which then became public

domain and fair game for squatters. Ranch titles represented little as collateral. Although the claims of some owners were eventually substantiated, many of the owners lost their land through bankruptcy or the inability to meet the exorbitant interest on their legal debts. Many of the original rancho owners eventually lost their land to the United States. Unsurveyed land boundaries created a loophole through which squatters could occupy plots on the fringes of land grants and eventually come to own those plots through squatters' rights (Gutierrez et al., 1998).

Fremont's second expedition crossed the Tehachapis via Oak Creek Pass on April 14, 1844 (Gudde, 1960). The first settlers in the Tehachapi Mountains were called Southern Democrats, an indicator of their allegiance to the South in the days before the Civil War. Between the 1850s and the 1870s, these settlers moved into Tehachapi from El Monte, the terminus of the Southern Emigrant Route near the San Gabriel Mission, heading north, through the San Fernando Pass at Beale's Cut, traversing San Francisquito Canyon, continuing north through Willow Springs and by Oak Creek Station, and finally through Oak Creek Pass into Tehachapi (Barras, 1976).

Mining in the general project vicinity began in the 1870s, when Dr. L.A. Crandall found a deposit of clay on Tropic Hill, then called Crandall Hill, west of Rosamond and east of the Alta East project. This clay was mined and shipped to a Los Angeles pottery company. The clay from this mine was manufactured into soil pipe and fire brick which was used to replace old plumbing and to build new buildings in the Pueblo de Los Angeles. The 1890s saw a slow-down in this business due to a country-wide depression. The owner of the pottery company, Ezra M. Hamilton, noticed gold flecks in the clay from Crandall Hill. Hamilton subsequently purchased the clay mine from Crandall. Hamilton spent two years looking for gold on the hill and finally found ore in 1894. The best producing mines, the Lida, the Fairview, and the Tropic, produced tons of ore and within months the area saw a huge influx of miners (Settle, 1967).

Agriculture and orchards developed in the Tehachapi Mountains quickly at the end of the 1800s. Pears, especially, were grown throughout the region. The Board of Trade in Tehachapi actively promoted orchard cultivation in 1915 (Barras, 1976). Shepherders moved into the area with their flocks. In the early 1980s tax incentives became available to companies that could generate electricity through harnessing the power of wind. The first of the wind farms were built shortly thereafter.

Mojave. The name Mojave is derived from the populous Yuman tribe who live along the Colorado where California, Arizona, and Nevada meet. The first time Mohave Desert appears in print is in George Wheeler's report for the Wheeler Survey in 1875. The town of Mojave was founded when the Southern Pacific Railroad (SPRR) reached the area in August of 1876. The station was named Mojave because of its location on the western side of the Mojave Desert (Gudde, 1960). Living shacks and saloons were the first structures built in Mojave. The first house and hotel were constructed by the Inestero family, who moved to Mojave from Bodie in 1876. The first freight depot and post office opened that year, as well. The second major rail line, the Atchison, Topeka, and Santa Fe Railway, arrived in 1884. Mojave served at the terminus for the SPRR and all SPRR trains were yarded at Mojave. Both the Southern Pacific and Santa Fe Railroads maintained additional crew and engines to assist trains with the ascent through the Tehachapi Pass (Signor, 1983).

In 1884, the Twenty Mule Teams pulled into Mojave, the terminus for the shipment of borax ore from the Harmony Borax Mining Company mines in Death Valley 165 miles away. The wagons for these mule teams were constructed in Mojave, as well. Other interesting events in 1884 include the burning of most of the buildings in Mojave, followed shortly by a huge sandstorm which blew down the majority of the newly constructed buildings erected after the fire (McAllister, 2005). The mule teams stopped operating in 1889 when borax was discovered near Barstow. Gold was discovered near Mojave in 1894, bringing another influx of miners, and the business district burned down again in 1899. In 1907, the first of the Los Angeles Aqueduct workers arrived in Mojave (Deaver, 1967). Mojave experienced a second gold boom in the 1930s when more discoveries of gold were made near the town (Powers, 2002).

The Marines moved into Mojave in 1942, constructing a Naval Air Station east of town. Navy and Marine pilots trained at the station during World War II. The base was decommissioned after the war. The field was reopened during the Korean conflict and closed again in 1959. In 1972, the airfield reopened as a part of the Mojave Airport District. Mojave eventually became the home to a number of different aerospace companies as well as the first inland spaceport in the United States. The first private space flight left Mojave in 2004. Unused planes as well as the remains of defunct aircraft dot the small airport's landscape. Mojave also remains a railroad town, mining town, and aqueduct town into the present. The Union Pacific and the Burlington Northern Santa Fe railroads connect in Mojave. The Golden Queen Mining company plans to begin gold and silver mining operations on Soledad Mountain and an office of the Los Angeles District of Water and Power maintains a branch in Mojave (City of Mojave, 2009).

Tehachapi. Tehachapi first appeared on a map of the Pacific Railroad Survey in 1853 as Tah-ee-chay-pah Pass, so named for the term used by local Native Americans to refer to the nearby creek. The local post office was labeled Tehichipa in 1870 and a map of the area in 1874 shows Tahichipi Pass, Creek, Valley, and town. The Southern Pacific built the railroad through the canyon and pass in 1876 to Tehachapi Summit station. A new town developed at the rail station, the name eventually being shortened to Tehachapi (Signor, 1983). The post office, a mile from the station, was originally called Greenwich for its postmaster but appears as Tehachapi by 1898 (Gudde, 1960). Early in the 1930s a site southwest of Tehachapi was chosen for a women's prison. In July of 1952, the second largest earthquake recorded in California at that time was epicentered near Tehachapi, along the White Wolf Fault. The quake was recorded as 7.5 on the Richter scale. Many buildings were leveled in the town and all rail, telephone, and highway lines between the southern San Joaquin Valley and Los Angeles were severed (Signor, 1983). The prison, which was closed after the 1952 quake, reopened in 1953 as an extension of the Chino prison, a men's facility (Barras, 1967). The prison has been subsequently expanded and upgraded and was eventually annexed into the City of Tehachapi (McAllister, 2005).

Wind Energy in the Tehachapis. The Tehachapi Pass is one of the windiest places in the world. Heat from the Mojave Desert sucks air from the Central Valley, which results in east-blowing winds gusting through the Pass in the spring and early summer. Beginning in 1981, developers installed 150 turbines in California, which represented 10 megawatts (MW) of power, the first of the California wind farms. The following year 1,200 turbines were installed. The numbers of installed turbines increased dramatically each subsequent year: in

1983, 2,549 turbines were installed, and in 1984, 4,732 turbines were installed at Altamont, Tehachapi, and San Geronio. The turbines at these three locations totaled 96 percent of the wind energy capacity in the United States in 1984. Zond Systems, Inc. began the construction of the Victory Garden wind farm in 1981 in Tehachapi Pass. This wind farm consisted of 1,338 turbines by the mid-1980s (Righter, 1996).

The Alta East Project Vicinity. The undeveloped and open desert of the Alta East project has been the site of much mining activity. Prospect pits dot the landscape. Hunting was historically popular and Oak Creek Pass was originally the sole route through the Tehachapi Mountains. Stage routes are visible on G.M. Wheeler's 1876-1879 map of the Tehachapi Mountains running just south of the Alta East project. Wind farms abut the Alta East project on three sides. The largest influx of temporary residents in the Alta East project area, however, was that of the construction crews of the Los Angeles Aqueduct. Between 1908 and 1913, thousands of men flocked to the Mojave Desert to help build an aqueduct, which at that time was the longest aqueduct in the world. The 1960s saw another influx of workers during construction of the Second Los Angeles Aqueduct.

Los Angeles Aqueduct. Los Angeles city officials realized in the early 1900s that the city possessed an inadequate supply of fresh water for its growing population. An annual report prepared by the superintendent of the Los Angeles City Water Company, William Mulholland, showed that Los Angelenos consumed over 26 million gallons of water per day (LADWP, 2002). Early in 1905, Mulholland announced to the Board of Water Commissioners that the Owens River was the only viable source of water for the city. The river had been identified and suggested to Mulholland earlier that year by Fred Eaton, the previous superintendent of the Los Angeles City Water Company, who was at that time the mayor of Los Angeles (Mulholland, 2002). In 1905, the Owens River project was announced to the population of the City of Los Angeles. Subsequently, the Board of Water Commissioners asked the City to issue 1.5 million dollars in bonds to purchase water and land for an aqueduct to bring water from the Owens Valley into the Los Angeles Basin. The bond money would also be used for the inaugural work of the construction of the Aqueduct. The citizens of Los Angeles approved the measure overwhelmingly in September 1905. The original vision of bringing water to Los Angeles from the Owens Valley was that of then-Los Angeles mayor, Fred Eaton (Heinly, 1910)). The general plan of the Aqueduct was designed by Mulholland. The plan began with an intake on the Owens River, approximately 35 miles north of Owens Lake, and the system comprised several miles of open canals, both lined and unlined, conduits, tunnels, siphon pipes, flumes, and reservoirs, until the Aqueduct emptied into the San Fernando reservoir (City of Los Angeles, 1916).

Preparatory work included the construction of roads and trails to move supplies necessary for the construction of the Aqueduct, as well as the construction of power plants, transmission lines, and telegraph and telephone lines. Road were constructed parallel to the Aqueduct in the desert divisions and connected to the nearest shipping points on the rail line. A total of 505 miles of roads and trails were constructed. Within the Mojave division, the portion of the Aqueduct located in the Alta East project area, supplies were simply hauled by animals or traction engines called Caterpillars over the level desert from Mojave to the Aqueduct and roads weren't necessarily needed. An additional branch of the SPRR, known as the California and Nevada Railroad, was constructed from Mojave, California,

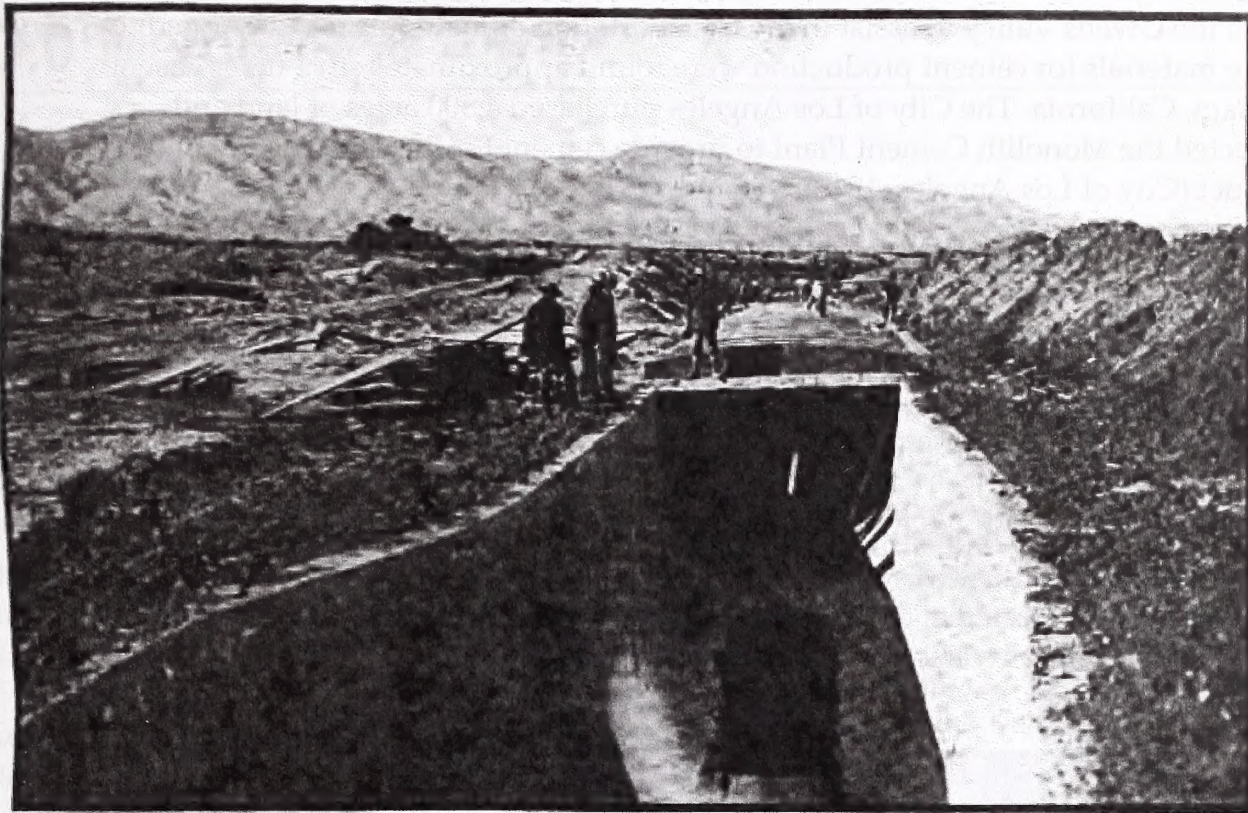


PHOTO 1

Underground conduit; a portion of the Los Angeles aqueduct located in the vicinity of the Alta East project.

Source: Heinly, 1909.

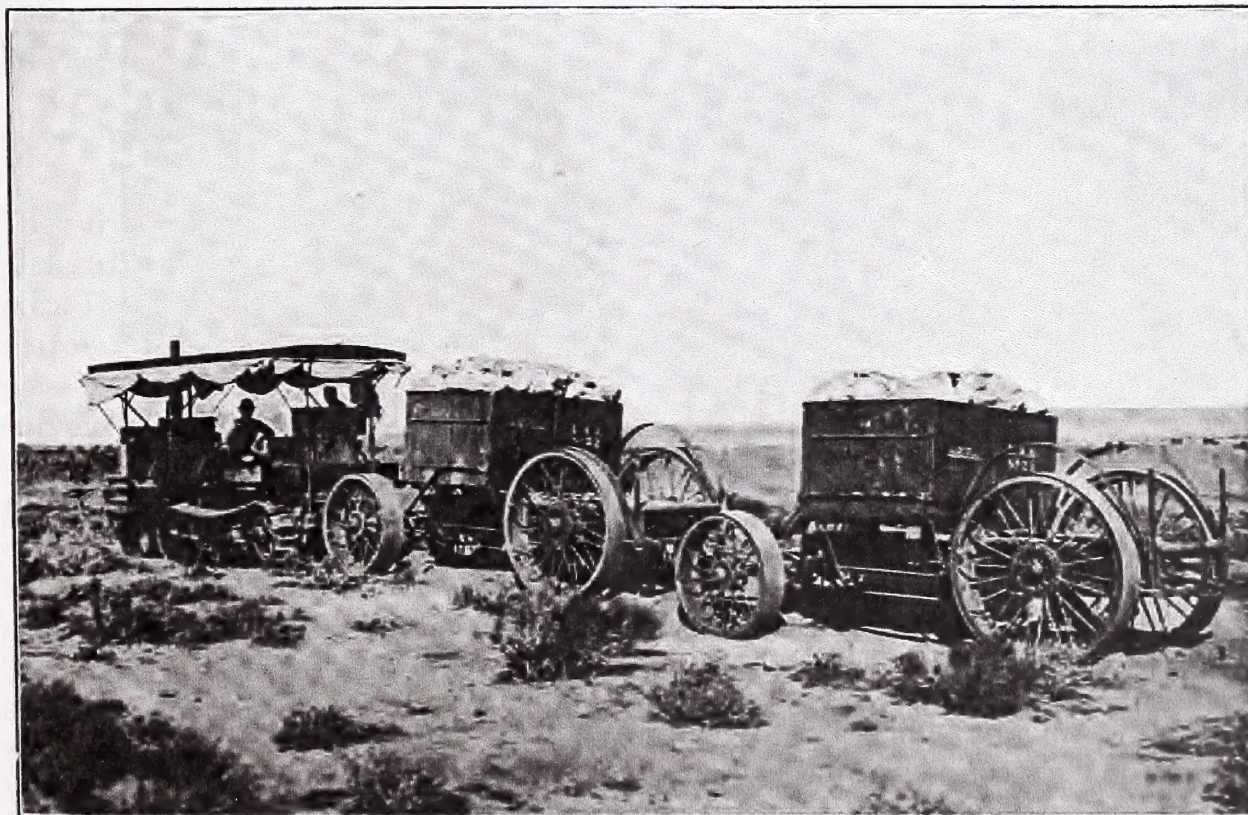


PHOTO 2

Hauling supplies for Aqueduct construction west across the desert from Mojave, California.

Source: City of Los Angeles, 1916.

north to the Owens Valley to assist in the transportation of materials for the Aqueduct. Suitable materials for cement production were found approximately five miles east of Tehachapi, California. The City of Los Angeles purchased 4,300 acres of land and constructed the Monolith Cement Plant to provide cement for the construction of the Aqueduct (City of Los Angeles, 1916).

Water was also needed, particularly in the Mojave Division, for both construction and to keep water available for the workers as well as the horse and mules teams. Water scouts mapped areas with water sources near the Aqueduct route and pipework began to bring water from these sources to the Aqueduct. By 1909, almost 150 miles of pipe had been laid, bringing water to the Aqueduct route from nearby mountains (Heinly, 1909). A total of 269 miles of water conduit was laid overall, varying in diameter from 2 inches to 12 inches. Pipeline was laid paralleling large sections of the Aqueduct from the intake to the San Fernando Valley. Branch pipe was laid up side canyons and virtually every spring or stream located near the Aqueduct was tapped for its water (City of Los Angeles, 1916). Large storage tanks were erected at each camp as movable equipment and the flow from the springs and creeks was collected at night to be moved to the construction sites during the day.



PHOTO 3

Excavation for Aqueduct conduit in the Mojave Desert division.

Source: Heinly, 1910.

By the 1950s the water brought to Los Angeles was not enough to meet the city's needs. Construction on the second Los Angeles Aqueduct began in 1965. It was completed in 1970, running roughly parallel to the first aqueduct for approximately 177 miles beginning at the Haiwee Reservoir (Powers, 2002). Cement used to manufacture this aqueduct was made at the CPC Mojave Plant (Wilson, 1991). Water from these two aqueducts provides approximately 70 percent of the water used in the City of Los Angeles.

3.0 Methods

3.1 Literature Search

A literature search for the Alta East project was conducted by staff at the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC) on March 15, 2010 at California State University, Bakersfield. A one-mile buffer zone around the project area was included in this search. The one-mile buffer zone was used pursuant to widely held professional standards and in conjunction with the fieldwork authorization process established for the project with the BLM. The CHRIS literature and records review included a review of all recorded archaeological sites as well as all known cultural resource survey and excavation reports. The National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), California Historical Landmarks, and California Points of Historical Interest were all examined. State and local listings were consulted for the presence of historic buildings, structures, landmarks, points of historical interest, and other cultural resources.

Additionally, the following historic maps were reviewed: 1876-1879 Lt. G.M. Wheeler's map of the Tehachapi Mountains; 1915 Mojave, California 30' USGS topographic quadrangle map; 1947 Mojave, California 15' USGS topographic quadrangle map; 1956 Mojave, California 15' USGS topographic quadrangle map; 1966 Monolith, California 7.5' USGS topographic quadrangle map.

3.2 Pedestrian Survey

The survey for prehistoric and historic archaeological resources was performed using pedestrian transects spaced at 10- to 15-meter (m) intervals throughout the entire surveyed area. The topography of the project area is varied and ranges from relatively flat lowlands to narrow ridgelines bounded by brush-covered slopes. The majority of the Alta East project was surveyed for cultural resources. Slopes that exceeded 25 percent were opportunistically surveyed; all ridge tops and lower-lying areas were surveyed. See Appendix B for photographs of the project area. Many of the steeper slopes were surveyed during the process of accessing the higher ridgelines. Although slopes greater than 25 were only opportunistically surveyed, all were examined for the presence of bedrock outcrops, historic features, or anomalous characteristics. If any such features were noted, these were examined during the opportunistic survey. Subsurface exposures, including rodent burrows and cut banks, were examined. Survey crews navigated via a Trimble Geo XT global positioning system (GPS) unit. Each GPS unit contained the survey area shape files, all previously recorded site boundaries, and all previously recorded resources. Additionally, transects were recorded using GPS during the survey to record that the survey was accomplished using the 10- to 15-m intervals.

The California Office of Historic Preservation's (OHP's) *Instructions for Recording Historical Resources* (1995) defines a site as the location of a prehistoric or historic occupation or

activity. Areas with five or more items were recorded as sites, while areas with four or less items were recorded as isolated occurrences (IOs). Features were recorded as sites. Resources separated by more than 50 m or located on different landforms were recorded as distinct sites or as isolates.

Cultural resources, including previously identified and new sites and isolated finds, were recorded on appropriate Department of Parks and Recreation forms, mapped using a Trimble Geo XT GPS unit, and photographed. Information on the appearance and physical characteristics of the resources as well as the location of the resources was gathered. The survey was non-collection; all artifacts were mapped and photographed in-place. No artifacts were collected by CH2M HILL.

4.0 Results

4.1 Literature Search

The literature search conducted by the SSJVIC revealed that several previous studies had been conducted within the Alta East project area. All previous surveys were thoroughly reviewed. Table 2 lists all previous studies conducted within one mile of the Alta East project.

TABLE 2
Cultural Resources Reports within 1 Mile of the Alta East Project

Report Authors and Date	CHRIS Catalogue NADB Numbers
Adams et al. (1984)	KE-2*
Fleagle (1996)	KE-45
Have Mule Will Travel (1983)	KE-270
Caruso (1982)	KE-313*
Jackson (1992)	KE-527*
Macko and Weisbord (1985)	KE-634*
McManus and McGuire (1985)	KE-651*
Noble and Tordoff (1988)	KE-715*
Sutton (1989)	KE-808
Peak (1974)	KE-873*
Salpas (1984)	KE-1029
Salpas (1984)	KE-1030
Schiffman (1982)	KE-1087
Schiffman (1985)	KE-1102
Schiffman (1985)	KE-1107*
Schiffman (1985)	KE-1113*
Schiffman (1986)	KE-1217
Schiffman (1987)	KE-1337
Schiffman (1990)	KE-1390
Schiffman (1982)	KE-1486
Tremaine (1993)	KE-1646*
Schiffman (1982)	KE-1649
Uli and Schiffman (1984)	KE-1693

TABLE 2
Cultural Resources Reports within 1 Mile of the Alta East Project

Report Authors and Date	CHRIS Catalogue NADB Numbers
Uli and Schiffman (1984)	KE-1709*
Uli and Schiffman (1985)	KE-1714*
Young (1978)	KE-1829*
Rubelman (1984)	KE-1859
Laylander (1998)	KE-2192*
Bureau of Land Management (1998)	KE-2197*
Bureau of Land Management (1998)	KE-2205*
Laylander (1998)	KE-2224
LSA Associates, Inc. (1999)	KE-2294
Laylander (1999)	KE-2298
Schiffman (2001)	KE-2565
Dodd (2001)	KE-2585
Schmidt (2002)	KE-2617
Billat (no date)	KE-2651
Nilsson et al. (2007)	KE-3534*
Switalski (2006)	KE-3571*

Note:

* Included portions of the Alta East project area.

Source: CHRIS Southern San Joaquin Valley Information Center.

A total of two resources, shown on Table 3, were found to be located within the survey area during the literature search. Neither of these resources has been previously evaluated for listing on either the NRHP or the CRHR. Additional information about each resource is provided below. A total of 26 additional resources were found outside the survey area but within the Alta East project and within a one mile buffer of the overall Alta East project.

TABLE 3
Previously Recorded Cultural Resources within the Survey Area

Site Number	Site Type	NRHP/CRHR Status	Date listed/evaluated
15-321	Prehistoric habitation site	Not evaluated	n/a
15-1703	Milling station w/ artifacts	Not evaluated	n/a

Source: CHRIS Southern San Joaquin Valley Information Center.

Site 15-321. This site was originally recorded in 1974 as a light flake scatter and lithic reduction site. This site boundary for the site as originally recorded was located completely outside of the Alta East archaeological survey area. The site was updated in 1984 as a habitation site with two distinct loci. Groundstone, fire-affected rock, and two chert flakes were noted at Locus A. Locus B contained four to five clusters of fire-affected rock. A new site boundary was drawn and this boundary extended partially into the Alta East survey area. At that time, the site had been disturbed by extensive rodent burrows, grazing sheep, modern roads, motorcycles, and a ditch. This site has not been previously evaluated.

Site 15-1703. Site 15-1703 was originally recorded in 1984 as three shallow bedrock mortars on a single rock outcrop. The mortars were noted as shallow and partially exfoliated. A graded berm was noted adjacent to the site. No artifacts were recorded at this site. This site has not been previously evaluated.

4.2 Native American Consultation

Government-to-Government Native American consultation is being conducted by the Bureau of Land Management. Results are not available at the time of this reporting.

4.3 Pedestrian Survey

A systematic pedestrian cultural resource survey was conducted from May 11, 2010 through May 28, 2010 by CH2M HILL archaeologists Natalie Lawson, Ryan Rolston, Ken Hazlett, Jesse Shelmire, and John McDermott. Site recordation of archaeological sites was conducted between May 11, 2010 and August 19, 2010. The survey was conducted under CH2M HILL's California State BLM Cultural Resources Use Permit No. CA-07-17 and BLM Ridgecrest Field Office Fieldwork Authorization executed on August 11, 2009.

Two previously recorded sites were updated during the archaeological survey of Alta East project. Only one of these sites was relocated; the other site is located in an area with a large crossroad of several dirt roads and only two flakes were found. A total of 13 new cultural sites were found during the survey and subsequently recorded (Table 4). Site types found include prehistoric lithic scatters, one prehistoric quarry, historic can scatters, historic mining sites, and one historic well. These resources are further discussed below. Each site was recorded on a DPR 532 Primary and a DPR Location form. Additional forms, including DPR Archaeological Site Record forms, Linear Feature forms, Milling Station Record forms, Artifact Records, Photograph Records, and Sketch Maps, were completed as necessary. A total of 45 new isolated occurrences of artifacts were found during the survey of these three areas. Appendix A, Table 1 contains a complete list of IOs. Each IO was recorded on a DPR Primary and a DPR Location form. Appendix D contains all DPR and isolate forms. All site forms will be submitted to the SSJVIC. Representative project photographs are provided in Appendix B.

The Alta East survey area consists of 1,400 acres and is located primarily in the Joshua Tree Woodland community. The Alta East survey area topography is quite varied. Some areas, such as those near the Los Angeles Aqueduct on the eastern side of the project site are relatively level. These areas were completely surveyed with transects spaced 10 to 15 m apart. The Chaparral and Pinyon Juniper areas consist of relatively level areas that transition

into gently sloping areas, as well as slopes greater than 25 percent. The majority of these areas, more than 85 percent, were surveyed, including several sloping areas which exceeded 25 percent at transect intervals of 15 m. On the far northwestern edge of the project, topography included low ridgelines with gentle slopes and several high ridgelines with dramatic slopes. All ridgelines in these areas were surveyed at intervals of 5 to 15 m, depending upon the width of the ridge. Due to limited vehicular accessibility of several of these high ridgelines, opportunistic survey of several of these slopes was completed. Visibility through this survey area is excellent at approximately 80 to 90 percent. Some outcrops were noted within the survey area. These outcrops appear to be an igneous material and are fairly exfoliated. Disturbances to the survey area consist of several episodes of dumping, both modern and historic, several dozen modern dirt roads, several small modern campsites, and mining activities, both modern and historic. On the northern end of the project, the large areas are cleared and concrete pads which appear to have been for wind turbines were observed. Several roads lead between these concrete pads and the entire area is graded and highly disturbed. Observed modern trash includes beer bottles, beer cans, shell casings, clay pigeon fragments, sanitary cans, and trash related to off-road vehicles, such as motorcycle parts. The remains of several sheep were noted and in general, the area appears to be heavily used for shepherding. Large washes cross the Alta East survey area and trash, modern and historic, as well as good-sized cobbles were observed in these washes. Sediment was generally alluvial deposition of sand and decomposing granitic material; areas around washes are sandy.

TABLE 4
Recorded Cultural Resources within the Survey Area

Site Number	Site Type	Site Description
15-321	Habitation	Only two flakes were relocated in the site area within the survey area
15-1703	Milling Station	Mortars; one prehistoric flake tool
S-1	Linear Feature	Multiple sections of wooden pipe
S-3	Quarry	Cobble testing area and quarry
S-4	Trash Scatter	Can scatter
S-5	Trash Scatter	Can scatter
S-6	Trash Scatter	Can scatter
S-7	Trash Scatter	Can scatter
S-8	Trash Scatter	Can scatter
S-9	Trash Dump	Can dump in 5 small ravines
S-10	Mining Site	Claim cairn
S-11	Mining Site	Prospect pit and fire ring
S-12	Lithic Scatter	Small sparse scatter of flakes
S-13	Lithic Scatter	Small obsidian scatter and one projectile point
S-15	Mining Site	Historic well, riveted pipe, cans

Resource Types Observed. Several site types were identified during the Alta East archaeological survey. Definitions of site types have been taken from the California Office of Historic Preservation's *Instructions for Recording Historical Resources* (OHP, 1995) and the National Register Bulletin 16A, *How to Complete the National Register Registration Form* (NPS, 1997). Prehistoric site types found are discussed first; historic site types follow.

Habitation: Habitation sites contain deposits that are characterized by a variety of artifacts and features, including ecofacts and fire-affected rock, which indicates a wide range of human activities.

Lithic Scatter: A lithic or flake scatter contains a scatter of only flaked stone tools such as cores, lithic debitage, or bifaces that may have been created from one or more distinct lithic reduction episodes.

Milling Station: A milling station is a locality where the primary activity consists of milling. Most milling stations contain little else but milling, and the majority of artifacts at a milling station will be milling tools such as manos, metates, mortars, and pestles; however, a study conducted of milling stations in the Tehachapi Mountains showed that milling stations in this area are often associated with lithic scatters and other flaked stone tools (Parr and Sutton, 1991). Ecofacts such as bone and shell suggesting use as a habitation site will be absent.

Quarry (Lithic Procurement): A quarry is a location where the primary activity consisted of procuring material for stone tools. Quarry sites may be extensive and involve the mining of lithic material, or the site may be an area where cobbles from outcrops were tested for suitability of lithic reduction (or flaking) qualities. Such areas are sometimes referred to as lithic prospects (Wilke and Schroth, 1989). Quarry sites do not usually contain ceramics, bedrock milling, or faunal material.

Historical sites are defined as sites that are not prehistoric or protohistoric, but are the remains of human activities more than 50 years old. A historic archaeological site includes sites, activity areas, cultural landscapes, and structural ruins as well as surface or buried cultural deposits or features.

Linear Feature: A linear feature typically includes historic roads, trails, fences, windrows, ditches, and railroad grades constructed in linear fashion. Many hydrologic features, such as irrigation lines or aqueducts, are linear features.

Mining Site: Any excavation to extract ore or other natural resources. This category includes historic quarries, prospect pits, and any associated structures built to withdraw these resources from the earth.

Trash Scatter/Dump: This term encompasses any historic refuse deposit. A trash scatter is widely "scattered," while dumps are typically larger with a more dense concentration of material, and may contain evidence of more than one dumping episode.

4.4 Archaeological Resources Observed

Site 15-321. CH2M HILL revisited the recorded location of 15-321 in May 2010. This site visit confirmed that there is no longer a prehistoric site located within the Alta East survey area

at the currently recorded location of 15-321. The portion of the site located within the Alta East project area appears to have been removed by extensive off-road activity. Two isolated flakes were found in the site vicinity; no other artifacts were located.

Site 15-1703. CH2M HILL revisited the location of 15-1703 noted on the maps at the SSJVIC in May 2010 during the Alta East project archaeological survey. The site was found generally as previously described; however, disturbance around this site is much greater. An old wind farm, graded roads and concrete turbine footings cover the rise and the sediment directly around the rock outcrop with the mortars is completely disturbed. One chalcedony flake tool was found approximately 60 m away.

Temporary Site No. S-1. This historic site consists of several sections of isolated wooden pipe. Much of this pipe appears to be in situ and runs along a modern two-track dirt road. The sections which appear to remain in situ are partially buried but do not appear to be connected to each other. Overall, the pipe stretches approximately 600 m northwest to southeast. A total of six sections were located on the northern end of the line. Some of these sections are not in situ and are dumped alongside the road. All of the sections are comprised of wooden pipe wrapped in thick wire. The outer diameter of the pipe is 6". The inner diameter is 3 1/2". The sections are in various states of disrepair. The road along which the in situ pipe runs is not visible on any historic maps reviewed. The segments are likely related to the construction of the Los Angeles Aqueduct and were used to import water from local streams and creeks into the aqueduct camps. A prospect pit with a few bits of trash dating to the 1960s or 1970s is located near the southernmost segment of pipe.

Temporary Site No. S-3. This prehistoric site is a cobble testing and quarry area, or a lithic procurement site. Several nice flakes and cores of a white chalcedony material were noted at this site. The site has three primary areas where lithic reduction appears to have occurred. Each of these reduction areas has at least one source outcrop, at least one core or test cobble, and several primary flakes. Although the majority of the flakes observed at the site are primary flakes, secondary and tertiary flakes were observed as well. Cores are multidirectional and most have some remaining cortex. One hammerstone was noted on this site. The densest portions of the site have approximately 5 to 10 flakes per square meter. Two modern two-track roads run through the middle of the site. Artifacts were observed in these roads; however, the densest portions of the site are located off of the roads. There does not appear to be a subsurface component.

Temporary Site No. S-4. This historic site is a sparse can scatter that measures 80 m by 50 m. The site consists of several solder dot cans, 5-gallon cans with soldered seams, flat top quart oil cans, and scrap metal. The site appears to date to the 1930s or 1940s. Hole in top cans, also called solder dot cans and vent hole cans, date from approximately 1900. Use of soldered cans declined after WWI when sanitary cans became more commonly used; however, evaporated milk was preserved in these cans well past WWII. Pennzoil began producing their motor oil in 1931. Vegetation in the immediate area includes creosote, Joshua trees, and Mormon tea bushes.

Temporary Site No. S-5. This historic site is a small sparse can scatter that measures 55 m by 40 m. The site consists of four solder dot food cans, three sanitary cans, two pieces of scrap metal, and one heavy aluminum wash tub. Vegetation in the immediate area includes creosote, Joshua trees, and Mormon tea bushes.

Temporary Site No. S-6. This site has both prehistoric and historic components. The prehistoric component is limited to two white chalcedony tertiary flakes. The historic portion of the site consists of seven cans. Several fire-affected cobbles loosely clustered together in a 2 m by 1 m area were also noted at this site. No other cobbles were observed within the site and it is possible that these cobbles could have been a fire hearth. Overall, the site measures 40 m by 50 m. The area is generally undisturbed. Modern trash was observed at the site.

Temporary Site No. S-7. This historic site is a widely dispersed but sparse can scatter that measures 75 m by 80 m. A total of 15 cans, including solder dot cans, sanitary cans, and 5-gallon solder seamed cans, and 6 pieces of scrap metal were recorded at this site. The site is located within an old wind farm and surrounded by modern graded dirt roads. Footings for previous turbines are located within the boundaries of the site. Modern trash was observed, as well. Creosote, Joshua trees, and Mormon tea bushes were observed in the area.

Temporary Site No. S-8. This historic site is a widely dispersed can scatter. A total of 10 solder dot cans which date before the 1950s were recorded. The majority of these cans are smashed flat. Several cans are knife opened. A total of seven sanitary cans were observed as well. Several modern cans, primarily soft top beverage cans, modern glass, and wire were also noted in the area. Three pieces of porcelain were also noted; however, no maker's mark was observed on any of these fragments. A modern bottle cap was also observed. Overall, the site measures 40 m by 90 m. Several small drainages run through the site.

Temporary Site No. S-9. This historic site is a large can dump which spans 5 small ravines. The cans are only located on the northwestern side of the ravine that runs in a northeast-southwest direction. As there are no cans on the southeastern side of the ridge and no cans on the rises separating the ravines, it appears as though the cans were dumped directly into the ravines over time. Overall, the site measures approximately 300 m by 110 m. A total of 300+ cans were noted, including solder dot cans, paint cans, sanitary cans, 5-gallon metal drums, 12-ounce flat top beverage cans with crimped seams, 16-ounce flat top beverage cans, flat top quart oil cans, external friction tins, and 1-gallon rectangular cans with soldered seams and screw tops. Several pieces of scrap metal were noted. A number of the cans have been partially or completely buried by sediment washing down the slopes of the ravines. No modern trash was observed. Cans were noted at the base of the slope, and appear to have washed downslope from the original dumpsite.

Temporary Site No. S-10. This site is a historic mining site that consists only of a claim cairn. The cairn is constructed of 16 large rocks. An old style electrical tape canister was found in the cairn. The canister, which is a Manson tape canister, dates from the early 1900s into the 1940s. Something appears to be in the canister, possibly paper, but the canister is rusted shut. Creosote, Joshua trees, and Mormon tea bushes were observed in the area.

Temporary Site No. S-11. This site is a historic mining site which measures 15 m by 15 m. The site consists of a prospect pit and a fire ring. A single .22 caliber rifle shell was noted. This shell is stamped with a "U". This headstamp is the symbol for Union Metallic Carbide company and dates between 1902 and 1962. The prospect pit is 2 ½ feet deep and has a diameter of approximately five feet. The fire ring measures 45" by 40" and consists of 18 large rocks in a circular pattern. Several two-track dirt roads surround the site; none appear on any historic maps. The general area has been heavily impacted by off-road vehicle use; however, no modern trash or vehicle tracks were observed within the site.

Temporary Site No. S-12. This site is a prehistoric lithic scatter that measures 30 m by 50 m and consists of several flakes of various materials and three tool fragments. Observed materials include obsidian, jasper, chert, and chalcedony. Flake density is fairly sparse. All of the flakes observed are tertiary flakes and at least one bifacial thinning flake was noted.

Temporary Site No. S-13. This site is a prehistoric lithic scatter that consists of one projectile point, one flake tool, four flakes, and one piece of shatter. All items, save one flake, are obsidian. The single chert flake recorded was a nice white chert material. The projectile point is a small extended stem point and appears to date to the Late Prehistoric. The flake tool has use wear on two sides. All three of the obsidian flakes are tertiary flakes and the white chert flake is a secondary flake.

Temporary Site No. S-15. This site consists of a historic well made with riveted pipe, solder dot cans, and other assorted refuse. Overall, the site measures 35 m by 50 m. The well is set into a 38" deep pit and is made from metal secured with rivets. The top of the well extends 48" above the ground and has a diameter of 6". The well appears to be approximately 150 to 200 feet deep. A metal cable and extra pipe were found in the pit, as well. The extra pipe has a diameter of 4 1/2" and is approximately 12 feet long. A brown glass bottle fragment, one sanitary can with a soldered seam, and two knife opened solder dot cans were found at the site. The site is situated across the wash from one isolated solder dot can, I-43, and that isolated can is most likely related to this site. Creosote bushes, Joshua trees, junipers, and chamise bushes were observed in the area

Isolated Occurrences. The survey documented a total of 45 new isolates. These IOs are listed in detail in Appendix A, Table A-1. Isolates, by definition, lack immediate cultural context and therefore lack the data potential that would be required to be considered eligible for the NRHP or CRHR. None of the IOs represent unique archaeological resources and none are considered significant resources for the purpose of Section 106 or historical resources/unique archeological resources for the purpose of CEQA.

5.0 Determination of Eligibility and Assessment of Potential Effects

5.1 Standards of Significance

Standards of significance for the proposed project were determined from adopted standards from the following sources:

- National Register Bulletin 16A, *How to Complete the National Register Registration Form* (NPS, 1997)
- CEQA Guidelines Appendix G (2002)
- *Kern County General Plan* (March 2007)
- *Kern County Environmental Checklist Form* (May 2005)

Adopted standards of significance that are applicable to cultural resources are provided in the CEQA Guidelines Appendix G (2002). Significance criteria considered for the cultural resources impact analysis are provided below.

Adverse effects on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of federal agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

The protection of cultural resources is governed by several federal laws and regulations, including the National Historic Preservation Act (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990).

5.2 Applicable Standards

Under Section 110 of the National Historic Preservation Act, federal agencies are required to locate and inventory all resources under their purview that are recommended as eligible for inclusion in the NRHP on owned, leased, or managed property. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, determinations regarding the potential effects of an undertaking on historic properties are presented to the State Historic Preservation Office (SHPO), federally recognized Native American tribes, and other interested parties. A resource shall be considered to be historically significant if it meets the criteria for listing on the NRHP, including the following:

- It is associated with events that have made a significant contribution to the broad patterns of history (Criterion A)
- It is associated with the lives of persons significant to our past (Criterion B)
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C)
- Has yielded, or has the potential to yield, information important to the prehistory or history (Criterion D)

In addition to the above criteria, a resource must retain integrity to be considered historically significant. Integrity is the authenticity of the physical identity that is evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Rehabilitation or restoration does not necessarily discount a resource from eligibility. Integrity must also be evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource that has lost its historic character or appearance and is not eligible for the NRHP may still have sufficient integrity for the CRHR, if it maintains the potential to yield significant scientific or historical information or specific data.

An adverse effect on a cultural resource is defined as one that:

- Causes substantial adverse change in the significance of a historical resource by physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings
- Demolishes or materially alters those physical characteristics of a historical resource that convey its significance and that justify its inclusion in, or eligibility for inclusion in, the NRHP, CRHR, or a local register

Section 7052 of the California Health and Safety Code establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives. Penal Code Section 622.5 provides misdemeanor penalties for injuring or destroying objects of historical or archaeological interest located on public or private lands, but specifically excludes the landowner. Public Resources Code Section 5097.5 defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historical, or paleontological resources located on public lands.

5.2.1 National Register of Historic Places

The preservation of historic properties became national policy with the passage of the Antiquities Act of 1906, the Historic Sites Act of 1935, and the National Historic Preservation Act of 1966. The NRHP is used as a guide by federal, state, and local agencies, private groups, and citizens to identify the historical resources and to determine which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The

NRHP may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources
- Resources that contribute to a historic district
- Resources identified as significant in historic resource surveys
- Resources with a significance rating of Category 1 through Category 4 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP)

5.2.2 California Register of Historical Resources

As provided in California PRC Section 5020.4, the California Legislature established the CRHR in 1992. The CRHR is used as a guide by state and local agencies, private groups, and citizens to identify the state historical resources and to determine which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR, as instituted by the California Public Resources Code, automatically includes all California properties already listed in the NRHP. It also includes those formally determined to be eligible for listing in the NRHP (Categories 1 and 2 in the State Inventory of Historical Resources), as well as specific listings of the State Historical Landmarks and in the State Inventory of Historical Resources and State Points of Historical Interest. The CRHR may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources
- Resources that contribute to a historic district
- Resources identified as significant in historic resource surveys
- Resources with a significance rating of Category 3 through Category 5 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP; Category 5 indicates a property with local significance)

The CRHR follows the lead of the NRHP in utilizing the 50-year threshold. A resource is usually considered for its historical significance after it reaches the age of 50 years. This threshold is not absolute, but was selected as a reasonable span of time after which a professional evaluation of historical value/importance can be made.

5.2.3 Kern County General Plan

The general plan for Kern County contains guidelines for the preservation of cultural and historic resources in the county which provide ties to the past and are considered to possess value to residents and visitors. The following measures are to be implemented when projects may impact cultural or historic resources:

- Coordinate with the California State University, Bakersfield, Archaeology Inventory Center.

- The County shall address archaeological and historical resources for discretionary projects in accordance with CEQA.
- The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through established procedures for discretionary projects and CEQA documents.
- On a project-specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

5.2.4 Kern County CEQA Implementation Document and Environmental Checklist

Kern County maintains a threshold of significance related to cultural resources. The Implementation Document and the Environmental Checklist state that a project could have a significant impact on cultural resources if the project could:

- Cause a substantial adverse change in the in the significance of a historical resource as defined in PRC § 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5;
- Disturb any human remains, including those interred outside of formal cemeteries.

6.0 California Register/National Register Status

A total of 15 sites were evaluated for inclusion in the NRHP and/or CRHR. These 15 resources recorded during the Alta East survey have been recommended as not eligible for inclusion in the CRHR (by recommendation of CH2M HILL). Table 5 shows each site's disposition and the CH2M HILL recommendations. A discussion of the eligibility of each site follows the table.

TABLE 5
Sites Evaluated during the Alta East Archaeological Survey

Site Number	Site Description	NRHP/CRHR
15-321	Only two flakes were relocated in the site area; the area is within the old wind farm	Not eligible
15-1703	Mortars; one prehistoric flake tool	Not eligible
S-1	Multiple sections of wooden pipe	Not eligible
S-3	Cobble testing area and quarry	Not eligible
S-4	Can scatter	Not eligible
S-5	Can scatter	Not eligible
S-6	Can scatter	Not eligible
S-7	Can scatter	Not eligible
S-8	Can scatter	Not eligible
S-9	Can dump in 5 small ravines	Not eligible
S-10	Claim cairn	Not eligible
S-11	Prospect pit and fire ring	Not eligible
S-12	Small sparse scatter of flakes	Not eligible
S-13	Small obsidian scatter and one projectile point	Not eligible
S-15	Historic well, riveted pipe, cans	Not eligible

Site 15-321. This site is no longer extant within the Alta East survey area and, therefore is not eligible for the NRHP or the CRHR under any of the Criteria. This resource does not qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Site 15-1703. This site lacks integrity and does not appear to have an intact subsurface deposit. The site, therefore, is not eligible for the NRHP or the CRHR under any of the Criteria. This resource does not qualify as historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-1. This pipe is in generally poor condition and the site appears to be related to the construction of the Los Angeles Aqueduct. Most of the pipe laid for the movement of water to aqueduct construction sites was removed after construction was completed and any remaining pipe would lack integrity. The site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-3. This site falls into the category of a lithic procurement site. The site is located at the top of a small rise and along the southern slope. A two-track road runs along the top of the rise and the ground is quite disturbed. The disturbance allows a good view of the lack of deposition at this site. The majority of the artifacts observed at this site appear to be on the surface of this site. Although two two-track roads cross the site, Temporary Site No. S-3 is in fairly good condition.

Five lithic procurement sites were recently evaluated utilizing shovel test pits at the nearby Alta Oak Creek Mojave project. Each of the five sites are similar in their archaeological deposits to each other, and to Temporary Site No. S-3 as well. All six of these sites contained a limited number of artifacts identified (predominately primary flakes), a low density of flakes, and for the most part a low quality, naturally occurring toolstone source. All shovel test pits excavated at each of these five sites evaluated as a part of the Alta Oak Creek Mojave project were negative. Four of the five sites were determined to be single episode lithic procurement sites lacking temporal markers and artifact diversity. The last site, which contained more artifacts, including some artifacts with patination, appeared to have been used more than once during the prehistoric period. Generally, this last site is quite similar to Temporary Site No. S-3. The low density and diversity of artifacts, lack of diagnostic artifacts or any other means of assigning a date of occupation to these sites, and lack of potential for buried intact deposits or stratified deposits prohibits using data from this site for addressing any of the questions posed in the research design for the evaluation of these sites. The lack of solid, temporally diagnostic data and the very low probability of recovering such data from any of these sites immediately precludes addressing research questions based on chronology, as well as aspects related to chronology such as determining settlement patterns, trade and exchange for a given time period. Furthermore, because artifacts associated with past ethnic groups are also temporally diagnostic, the lack of these artifacts at these sites indicates that questions related to the past ethnicity context cannot be addressed with data from these sites (Fergusson et al., 2010).

The nature of the assemblage of each of the five lithic procurement sites also limits the ability of the site to contribute to other research questions and contexts. The sites cannot address settlement pattern studies because the low number and diversity of artifacts reduces our ability to determine a time period for use. The lack of associated features and low likelihood for buried deposits reduce the probability that remains of subsistence activities (fauna, botanical material, etc.) will be recovered. Therefore, the sites cannot be used to address questions of subsistence systems. Although each of the sites do consist of lithic scatters of primary flakes, the low density of artifacts and lack of tools indicates that it is unlikely that data from the site could be used to address spatial structuring, tool function, biface production, reduction strategies, tool kits, and other questions. Although the flakes

found on the sites may represent a single or limited reduction episodes associated with opportunistic toolstone procurement, the low number of flakes precludes statistical analyses. Therefore, it is also not possible to address questions of lithic reduction strategies and the spatial organization of these strategies with these sites.

The five sites included in the Alta Oak Creek Mojave evaluation do not appear to contain data or to be likely to contain data that can address any of the regional prehistoric research questions. Temporary Site No. S-3 is quite similar to these five sites, appears to lack any associated subsurface deposits, and does not appear to have the potential to address any prehistoric research questions. The recordation completed as a part of the survey phase has exhausted the potential for gaining additional information important to the prehistory of the area. Therefore, it is recommended Temporary Site No. S-3 not be considered eligible for listing on the NRHP under Criterion D or the CRHR under Criterion 4. No further work is recommended at this site.

Temporary Site No. S-4. This historic site is a sparse can scatter that consists of several solder dot cans, 5-gallon cans with soldered seams, flat top quart oil cans, and scrap metal. The site appears to date to the 1930s or 1940s. Historic use of the area includes gold prospecting and mining, hunting, and the construction of the Los Angeles Aqueduct. Although this historic refuse scatter is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-5. This historic site is a small, sparse can scatter that consists of four solder dot food cans, three sanitary cans, two pieces of scrap metal and one heavy aluminum wash tub. Historic use of the area includes gold prospecting and mining, hunting, and the construction of the Los Angeles Aqueduct. Although this historic refuse scatter is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-6. This site has both prehistoric and historic components. The prehistoric component is limited to two white chalcedony tertiary flakes. The historic portion of the site consists of seven cans. Historic use of the area includes gold prospecting and mining, hunting, and the construction of the Los Angeles Aqueduct. Although the site is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, there are no definitive artifacts related to any of the historic events listed above and neither component of the site appears to possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a

historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-7. This historic site is a widely dispersed but sparse can scatter that consists of solder dot cans, sanitary cans, 5-gallon solder seamed cans, and scrap metal. Historic use of the area includes gold prospecting and mining, hunting, and the construction of the Los Angeles Aqueduct. Although the site is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, there are no definitive artifacts related to any of the historic events listed above and the site does not appear to possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-8. This historic site is a widely dispersed can scatter of 10 solder dot cans. Historic use of the area includes gold prospecting and mining, hunting, and the construction of the Los Angeles Aqueduct. Although the site is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, there are no definitive artifacts related to any of the historic events listed above and the site does not appear to possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-9. This historic site is a large can dump which spans 5 small ravines. However, there are no artifacts that can be definitively related to any locally-significant historic events and the site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not qualify as a historical property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-10. This site is a historic mining site that consists only of a claim cairn. Historic use of the area includes gold prospecting and mining. However, there are no artifacts that can be definitively related to any locally-significant historic events and the site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-11. This site is a historic mining site which measures 15 m by 15 m. The site consists of a prospect pit and a fire ring. Historic use of the area includes gold prospecting and mining. However, there are no artifacts that can be definitively related to any locally-significant historic events and the site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

Temporary Site No. S-12. This site is a prehistoric lithic scatter that consists of several flakes of various materials and three tool fragments.

Three lithic scatter sites were recently evaluated utilizing shovel test pits at the nearby Alta Oak Creek Mojave project. These three sites are similar in their surface artifacts to each other, and to Temporary Site No. S-12. Generally, small sites such as these represent one to a few episodes of activity; however, these activities are often isolated and present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as lithic scatters, can often present information important to the prehistory of the region. The sites lacked evidence of long-term occupation and intensive food or material processing.

These fairly sparse lithic scatters are limited to evidence of various stages of flakes from tool manufacture/maintenance. The results of the evaluation of the three lithic scatter sites at the Alta Oak Creek Mojave project showed that the locations of the surface deposited cultural material appears to be the result of secondary depositional processes and erosion. Cultural materials located subsurface are most likely not *in situ*. A number of natural and cultural factors can cause a downward displacement of cultural materials, particularly smaller items, including bioturbation, erosion, frost heave, and trampling by large animals such as cows or horses. The low density of lithic material and the limited number of significant temporally diagnostic tools indicates that it is unlikely that data from the site could be used to address spatial structuring, raw material procurement and use, tool function, biface production, reduction strategies, tool kit composition and other questions. Because of the dispersed nature of the flakes and the noted disturbance, there is nothing to suggest that they are related or that they represent a single reduction episode. As such, the sites appear to lack the integrity necessary to answer regional research questions regarding prehistoric settlement or subsistence patterns.

Consequently, none of the sites evaluated for the Alta Oak Creek Mojave project appear to have potential to meet any of the CRHR eligibility criteria. The sites do not appear to be associated with a significant historical event, and thus are not eligible under Criterion 1. The sites cannot be associated with a significant historical person, and thus are not eligible under Criterion 2. The sites contain no architecture, and thus are not eligible under Criterion 3. While earlier recordation of some of the sites indicate the presence of dateable artifacts, the surface assembly is highly mixed, and therefore the sites can address only limited questions of chronology. The secondary nature of the deposits suggests the sites have limited usefulness in diachronic models of prehistoric land use. Because the sites do not contain direct evidence of subsistence, and because features containing such evidence are lacking, the sites cannot address questions of subsistence. Because artifacts present are limited in their number and diversity, the sites can contribute little data to research questions (technology, raw material procurement, manufacturing strategies) related to these artifact classes (Fergusson et al., 2010).

Temporary Site No. S-12, which is quite similar in nature to the sites discussed above, also does not appear to contain data or be likely to contain data that can address any of the regional prehistoric research questions. The recordation completed during the survey phase of the Alta East project has exhausted the potential for gaining additional information to the

prehistory of the area. Therefore, it is recommended that Temporary Site No. S-12 should not be considered eligible for listing on the NRHP under Criterion D or the CRHR under Criterion 4. No further work is recommended at this site.

Temporary Site No. S-13. This site is a prehistoric lithic scatter that consists of one projectile point, one flake tool, four flakes, and one piece of shatter. The projectile point recorded at this site is a Late Prehistoric point associated with desert assemblages (Justice, 2002).

Temporary Site No. S-13, which is quite similar in nature to the sites discussed above, also does not appear to contain data or be likely to contain data that can address any of the regional prehistoric research questions. Although the site can be identified with the Late Prehistoric, the recordation completed during the survey phase of the Alta East project appears to have exhausted the potential for gaining additional information to the prehistory of the area. Therefore, it is recommended that Temporary Site No. S-13 should not be considered eligible for listing on the NRHP under Criterion D or the CRHR under Criterion 4. No further work is recommended at this site.

Temporary Site No. S-15. This site consists of a historic well made with riveted pipe, solder dot cans, and other assorted refuse. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. This historic refuse scatter is in fair condition. However, there are no definitive artifacts related to any of the historic events listed above and the site does not possess any particular archaeological potential to yield significant information on local history. The site does not appear to be eligible for the NRHP or the CRHR under any of the Criteria and does not appear to qualify as a historic property under Section 106 or a historical resource/ unique archeological resource under CEQA. No further work is recommended.

7.0 Potential for Buried Archaeological Resources

The current inventory has demonstrated that the survey area contains prehistoric and historical archaeological resources. Further, the geomorphological environment for the project area is one of alluvial deposition. Therefore, it is theoretically possible, though considered fairly unlikely, that portions of the Alta East survey area may contain low-to-moderate potential for archaeological resources to have been buried through alluviation, colluviation, or Aeolian processes.

8.0 Management Considerations

No historic properties or historical resources were located within the Alta East project. The Alta East project is not expected to impact historic properties or historical resources. As a result of this evaluation and in accordance with 36 CFR Part 800.4(d)(1), it is recommended that a determination of No Historic Properties Affected be found for this project.

As with any ground-disturbing project, there remains a potential for the accidental discovery of buried cultural resources not detected through a surface inventory. If cultural resources or materials are discovered during ground-disturbing activities, the work in the vicinity of the discovery should cease and the area be protected until the find can be evaluated by a qualified archaeologist. Depending on the nature of the find, additional consultation with the SHPO or Tribal leaders may be necessary before work can resume in the area of the find.

If human remains are discovered, the Kern County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. In addition, the BLM Ridgecrest Field Office archaeologist, Donald Storm, should be contacted at (760) 384-5422. If the remains are determined by the coroner to be Native American, the Coroner is responsible for contacting the Native American Heritage Commission within 24 hours. The NAHC, pursuant to Section 5097.98, will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal.

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Appendix A
Table of Sites and Isolates of the Alta East
Survey Area

Appendix A

Table of Sites and Isolates of the Alta East Survey Area

TABLE A-1

Sites and Isolates Within the Alta East Wind Project Archaeological Survey Area
Cultural Resources Inventory Report for the Alta East Wind Project, Kern County, California

Site Number		Site Period	Site Type	Dimensions (m x m)	Site Description	NRHP/CRHR Eligible?
Primary (15-)	Trinomial (CA-KER-)					
321	321	Prehistoric	Habitation	n.a.	Only two flakes were located within the survey area	Not in project area
1703	1703	Prehistoric	Milling station	10 x 10	One outcrop with three mortars, 1 flake tool 60 m away	Not eligible
	S-1	Historic	Linear feature	600 x 20	Multiple sections of wooden pipe	Not eligible
	S-3	Prehistoric	Quarry	80 x 90	Cobble testing area and quarry	Not eligible
	S-4	Historic	Trash scatter	80 x 50	Can scatter	Not eligible
	S-5	Historic	Trash scatter	55 x 40	Can scatter	Not eligible
	S-6	Historic	Trash scatter	40 x 50	Can scatter; 2 flakes, possible hearth	Not eligible
	S-7	Historic	Trash scatter	75 x 80	Can scatter	Not eligible
	S-8	Historic	Trash scatter	40 x 90	Can scatter	Not eligible
	S-9	Historic	Trash dump	300 x 110	Can dump in 5 small ravines	Not eligible
	S-10	Historic	Mining Site	10 x 10	Claim cairn	Not eligible
	S-11	Historic	Mining Site	15 x 15	Prospect pit and fire ring	Not eligible
	S-12	Prehistoric	Lithic scatter	30 x 50	Small sparse scatter of flakes	Not eligible
	S-13	Prehistoric	Lithic scatter	22 x 18	Small obsidian scatter and one projectile point	Not eligible
	S-15	Historic	Mining Site	35 x 50	Historic well, riveted pipe, cans	Not eligible
	I-1	Prehistoric	Isolated find	n.a.	One chert flake	n.a.
	I-2	Historic	Isolated find	n.a.	Two fragments of sun colored amethyst glass, 1 compression fit lid	n.a.
	I-3	Historic	Isolated find	n.a.	One hand finished brown bottle fragment	n.a.
	I-4	Prehistoric	Isolated find	n.a.	One chert biface	n.a.
	I-5	Prehistoric	Isolated find	n.a.	One chert flake, one quartzite core	n.a.
	I-6	Historic	Isolated find	n.a.	One small solder dot can	n.a.
	I-7	Prehistoric	Isolated find	n.a.	One chert flake	n.a.
	I-8	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-9	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-10	Historic	Isolated find	n.a.	One solder dot can and three sanitary cans	n.a.
	I-11	Historic	Isolated find	n.a.	One solder dot can and one sanitary can	n.a.
	I-12	Historic	Isolated find	n.a.	One brown bottle base, four fragments of aqua glass, one bottle base	n.a.
	I-13	Both	Isolated find	n.a.	One solder dot can and one flake	n.a.
	I-14	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-15	Historic	Isolated find	n.a.	Three fragments of green glass and one solder dot can	n.a.
	I-16	Prehistoric	Isolated find	n.a.	Two chert flakes	n.a.
	I-17	Prehistoric	Isolated find	n.a.	One chert flake	n.a.

TABLE A-1

Sites and Isolates Within the Alta East Wind Project Archaeological Survey Area
Cultural Resources Inventory Report for the Alta East Wind Project, Kern County, California

Site Number		Site Period	Site Type	Site Dimensions (m x m)	Site Description	NRHP/CRHR Eligible?
Primary (15-)	Trinomial (CA-KER-)					
	Temporary Site No.					
	I-18	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-19	Historic	Isolated find	n.a.	Three solder dot cans	n.a.
	I-20	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-21	Prehistoric	Isolated find	n.a.	One quartzite mano fragment and one basalt tool fragment	n.a.
	I-22	Historic	Isolated find	n.a.	Three solder dot cans	n.a.
	I-23	Historic	Isolated find	n.a.	Three solder dot cans and one flat top 12 oz beverage can	n.a.
	I-24	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-25	Historic	Isolated find	n.a.	Four solder dot cans	n.a.
	I-26	Prehistoric	Isolated find	n.a.	One chert core tool	n.a.
	I-27	Prehistoric	Isolated find	n.a.	One chert flake fragment	n.a.
	I-28	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-29	Historic	Isolated find	n.a.	Two solder dot cans	n.a.
	I-30	Prehistoric	Isolated find	n.a.	One chert flake	n.a.
	I-31	Prehistoric	Isolated find	n.a.	One obsidian flake	n.a.
	I-32	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-33	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-34	Historic	Isolated find	n.a.	One solder dot can	n.a.
	I-35	Historic	Isolated find	n.a.	One aqua glass bottle fragment	n.a.
	I-36	Historic	Isolated find	n.a.	Three fragments of sun colored amethyst glass	n.a.
	I-37	Prehistoric	Isolated find	n.a.	One obsidian flake	n.a.
	I-38	Historic	Isolated find	n.a.	One hinge top tobacco tin	n.a.
	I-39	Prehistoric	Isolated find	n.a.	One obsidian flake	n.a.
	I-40	Prehistoric	Isolated find	n.a.	Two chert flakes	n.a.
	I-41	Prehistoric	Isolated find	n.a.	One chert flake and one obsidian flake	n.a.
	I-42	Historic	Isolated find	n.a.	One solder seamed sanitary can and one solder dot can	n.a.
	I-43	Historic	Isolated find	n.a.	One solder dot can and two sanitary cans	n.a.
	I-44	Historic	Isolated find	n.a.	One hole in top can	n.a.
	I-46	Historic	Isolated find	n.a.	One solder dot can	n.a.

Notes:

n.a. = not applicable; NRHP = National Register of Historic Places; CRHR = California Register of Historical Resources



Photo 1. East Elevation of the New National Center

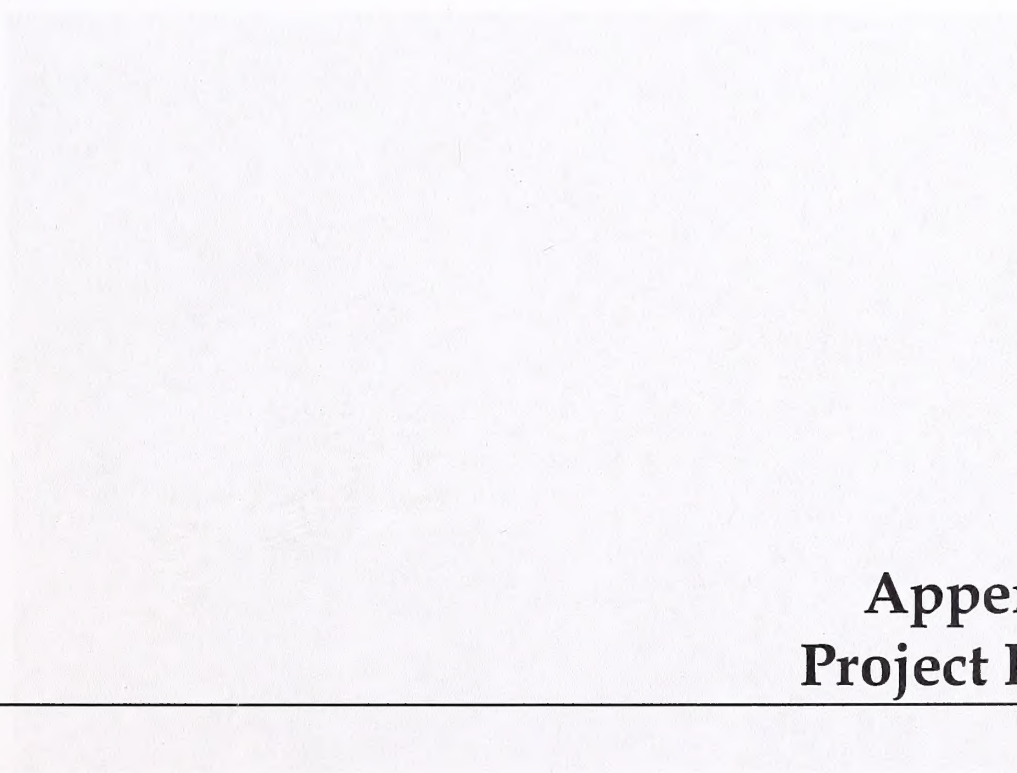


Photo 2. Groundwater survey of the New National Center

Appendix B

Project Photos



Photo 1, Slope Exceeding 25%. View to the west-northwest.



Photo 2, Opportunistic survey of slopes greater than 25%. View northwest.



Photo 3, Ridgeline survey. View southeast.



Photo 4, Old wind farm. View northeast.



Photo 5, Site recordation. View south.



Photo 6, Survey. View northwest.

Confidential Information has been removed

Department of Parks & Recreation

Appendix C

Survey Results Map

Confidential information has been removed.

Appendix C
Survey Results Map

Supplement No. 1 to the
Cultural Resources Inventory Report for the
Alta East Wind Project,
 Kern County, California



CH2M HILL

3111 Main Street, Suite 700
Santa Ana, California 92707

Revised July 2011

Appendix D

Department of Parks and Recreation Forms

Confidential information has been removed.

Appendix B
Department of Parks and Recreation Forms

**Addendum No. 1 to the
Cultural Resources Inventory Report for the
Alta East Wind Project,
Kern County, California**



**6 Hutton Centre Drive, Suite 700
Santa Ana, California 92707**

Revised July 2011

**Addendum No. 1 to the
Cultural Resources Inventory Report for the
Alta East Wind Project,
Kern County, California**

Report Prepared For:

**Alta Windpower Development, LLC
11682 El Camino Real Suite 320
San Diego, CA 92130**

Prepared by:

**Aaron Fergusson, M.A., RPA
with contributions by Clint Helton, M.A., RPA
CH2M HILL
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707**

Revised July 2011

National Archaeological Database (NADB)

Type of Study: Literature Search, Survey, and Evaluation

Sites Recorded/Updated: S-16, S-17, S-18, S-19, S-20, S-21, S-22, S-23, S-24, S-25, S-26,
S-27, S-28, S-29

Isolates Recorded: 25 new isolates

USGS Quadrangle: Monolith, CA; Mojave, CA; Willow Springs, CA

Acreage: 3225.5 acres

Level of Investigation: CEQA

Key Words: Tehachapi, Mojave, Oak Creek, Oak Creek Pass, Tehachapi Mountains, Mojave
Desert, Tehachapi-Willow Springs Road, Oak Creek Road, CEQA, Isolate, Positive Survey,
California Portland Cement Company, prehistoric site, historic site

Management Summary

CH2M HILL completed an additional cultural resources inventory of 3225.5 acres in support of the proposed development of the Alta East Wind Project (formerly known as Suncreek) in the Tehachapi Mountains and adjacent Mojave Desert in Kern County, California. The Alta East Wind Project is being proposed by Alta Windpower Development, LLC. Previous surveys were completed earlier in 2010 (Lawson et al., 2010). This report presents the results of inventory of an additional 3225.5 acres conducted to complete the coverage for the Alta East Wind Project area.

This study was conducted under CH2M HILL's California State Bureau of Land Management (BLM) Cultural Resources Use Permit No. CA-10-31 and BLM Ridgecrest Field Office Fieldwork Authorization executed on February 22, 2011. The purpose of the survey was to determine the presence of historic properties within the area of potential effects (APE), pursuant to Section 106 of the National Historic Preservation Act (NHPA) (36CFR800).

The cultural resources inventory was conducted in compliance with Section 5024.1 of the California Public Resources Code (PRC) to identify archaeological or historical resources in the area of potential effect. "Historical Resource" is a California Environmental Quality Act (CEQA) term referring to a resource eligible for or listed on the California Register of Historical Resources (CRHR) and generally older than 50 years of age by definition. Cultural resources include prehistoric and historic archaeological sites; districts and objects; standing historic structures, buildings, districts, and objects; and locations of important historic events, or sites of traditional/cultural importance to various groups. This assessment includes a review of previous studies, the results of a systematic pedestrian surface survey, and preliminary site evaluations of recorded resources. The archival research and fieldwork were completed in March 2011.

CH2M HILL cultural resources specialist Aaron Fergusson conducted a literature search in consultation with BLM's Ridgecrest Field Office archaeologist. The literature search was conducted on February 9, 2010 at the Southern San Joaquin Valley Information Center (SSJVIC), located at the California State University, Bakersfield.

CH2M HILL conducted a systematic pedestrian cultural resource survey from March 1 to March 17, 2011. Additional site recordation and reconnaissance was conducted by Aaron Fergusson on July 5 through 8, 2011. A total of 14 new archaeological sites and 25 isolated artifacts were documented within the survey area. One of the resources (S-29) has been recommended as potentially eligible for listing on the CRHR or the National Register of Historic Places. The remaining 13 new archaeological sites and 2 previously recorded sites have been recommended as not eligible.

If human remains are discovered, the BLM Ridgecrest Field Office Archaeologist and the Kern County Coroner must be notified within 48 hours, and there should be no further disturbance to the site where the remains were found. If the remains are determined to be Native American, the County Coroner will notify the Native American Heritage

Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or the landowner's authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

A copy of this report will be filed with the SSJVIC of the California Historical Resources Information System located at California State University, Bakersfield (CSUB) and the BLM Ridgecrest Field Office.

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- 1 Cultural Survey Areas
- 2 Cultural Survey Areas

Appendixes

- A Table of Sites and Isolates
- B Survey Maps
- C (Confidential) DPR Forms

Introduction

CH2M HILL was contracted by Alta Windpower Development, LLC (AWD) to complete a cultural resource assessment for the Alta East Wind Project (or project), a proposed wind energy development, in Kern County, California. AWD controls or has access to 7,842 acres of land, but the project will be constructed on approximately 4,642 acres of land, and the remaining 3,200 acres will not be disturbed. The permanent footprint will consist of up to 120 wind turbines along with substations, transmission lines, access roads, buildings, parking areas and ancillary facilities. The project's temporary facilities will include construction access roads, laydown areas, and concrete batch plants. Included in this survey are two alternative transmission line routes; Alternative A is 7,273 m long, and Alternative B is 4,366 m long. Both transmission lines include a 200-foot-wide buffer and are included in the total acreage calculation.

In 2009, AWD controlled or had access to 1,417 acres of land on which they had proposed to develop the project. Cultural resource surveys were conducted for the project, and an independent report was prepared and submitted for compliance review. By early 2011, AWD gained access to additional lands, totaling 7,842 acres, on which they proposed developing up to 4,643 acres, which includes the 1,417 acres included in the 2010 surveys. The remaining 3,225 acres, including the two transmission line alternatives, were surveyed for cultural resources in 2011 to accommodate additional potential layouts for the project; the results of this survey are contained in this report. The remaining 3,200 acres AWD has access to will remain undeveloped.

The project is located on private and federal lands; the federal lands are under the jurisdiction of the Bureau of Land Management (BLM), and private lands are under Kern County jurisdiction. Therefore, the project includes a federal undertaking, and the assessment of the entire project was completed to address the requirements of Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and implements regulations 36 Code of Federal Regulations (CFR) Part 800 for the proposed wind development.

These studies were conducted under CH2M HILL's California State BLM Cultural Resources Use Permit Nos. CA-07-17 and CA-10-31 and BLM Ridgecrest Field Office Fieldwork Authorizations, executed separately on August 11, 2009 and February 22, 2011. The purpose of the survey was to determine the presence of historic properties within the APE, pursuant to Section 106 of the NHPA (36CFR800).

The project area is approximately 3 miles northwest of Mojave, a Census Designated Population, and approximately 11 miles east of the City of Tehachapi in southern Kern County, California. The project is located west of State Route 14 (SR 14) on the north and south sides of SR 58, near the junction of SR 14 and SR 58. On the 1973 *Mojave, California 7.5'* and the 1995 *Monolith, California 7.5'* USGS quadrangle maps, the project is located in Township 11 North, Range 12 West, Section 6; Township 11 North, Range 13 West, Sections 1, 3, 6, 11-15, 19, 20, 22, 23, 27, 29, 30, 32-34; Township 11 North, Range 14 West Sections 1, 12, 13; Township 12 North, Range 12 West, Section 31; Township 12 North, Range 13 West,

Sections 31-36; Township 32 South Range 34 East, Section 36; Township 32 South, Range 35 East, Sections 20, 21, 26-29, 31-35. This cultural resources assessment focuses on areas of proposed disturbance, referred to here as the cultural resources survey area (survey area), which consists of 3225.5 acres (Figures 1 and 2).

Project personnel included Principal Investigators Clint Helton, M.A., RPA, and Aaron Fergusson, M.A. RPA; and Field Directors Natalie Lawson, M.A., RPA, and Gloriella Cardenas, M.A. RPA, who meet the professional qualification standards stated in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and are listed on CH2M HILL's California State BLM Cultural Resources Use Permit numbers CA-07-17 and CA-10-31. Field personnel included Ryan Rolston, John McDermott, Jessie Shelmire, Ken Hazlett, Dan Ewers, Humphrey Calicher, and Eric Peters.

This report contains several appendixes. Appendix A contains a table of sites and isolates recorded in the survey area. Confidential Appendix B contains maps depicting the area surveyed. Confidential Appendix C contains all DPR forms.

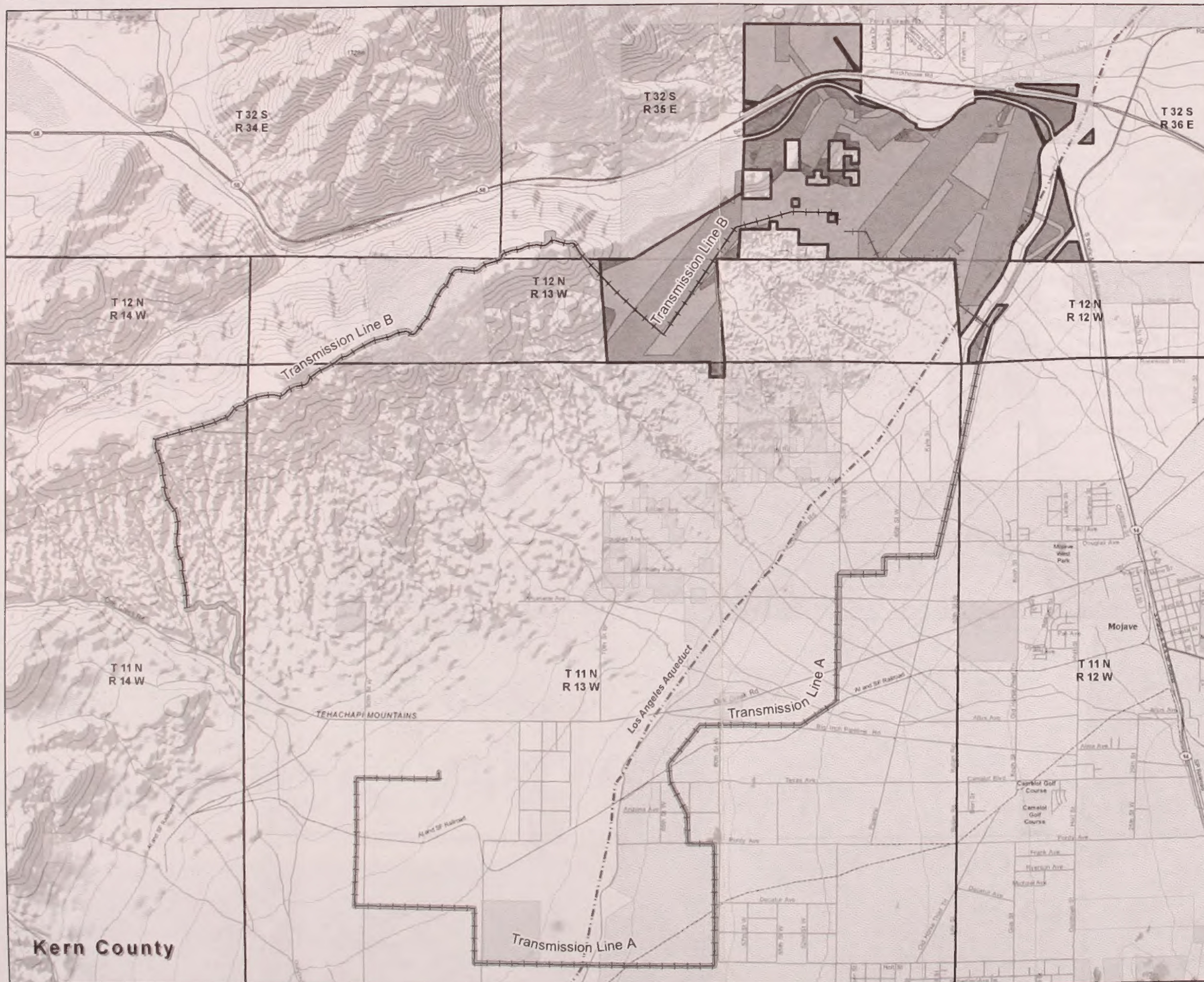
For a complete review of the environmental setting and culture history, see the Cultural Resources Inventory Report for the Alta East Wind Project (Lawson et al., 2010). These sections were not included in this addendum to the original report, because the environmental setting and culture history as described in the original report remain unchanged between the two surveys.



- LEGEND**
- Proposed Transmission Line Alternatives**
- +— Transmission Line Alternative A
 - +— Transmission Line Alternative B
- Cultural Survey**
- New Survey Area
 - 2010 Survey Area
 - Project Area
 - Township and Range
- Land Ownership**
- Bureau of Land Management
 - Private
 - State



Figure 1
Cultural Survey Areas
 Alta East Wind Project
 Alta Wind Energy Center Project



- LEGEND**
- Proposed Transmission Line Alternatives**
- +—+— Transmission Line Alternative A
 - +—+— Transmission Line Alternative B
- Cultural Survey**
- New Survey Area
 - 2010 Survey Area
 - Project Area
 - Township and Range
- Land Ownership**
- Bureau of Land Management
 - Private
 - State

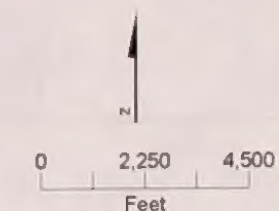


Figure 2
Cultural Survey Areas
 Alta East Wind Project
 Alta Wind Energy Center Project

Methods

Literature Review

CH2M HILL cultural resources specialist Aaron Fergusson conducted a literature search in consultation with BLM's Ridgecrest Field Office archaeologist. The literature search was conducted on February 9, 2010 at the Southern San Joaquin Valley Information Center (SSJVIC), located at the California State University, Bakersfield.

Pedestrian Survey

Survey methodology for prehistoric and historic archaeological resources was performed using pedestrian transects spaced at 15-m intervals throughout the project's entire survey area. The topography is varied and ranges from relatively flat lowlands to narrow ridgelines bounded by brush-covered slopes. Subsurface exposures, including rodent burrows and cut banks, were examined. Survey crews navigated via a Trimble Geo XT Global Positional System (GPS) unit. Each GPS unit contained the survey area shape files, all previously recorded site boundaries, and all previously recorded resources.

The California Office of Historic Preservation's Information Center Procedural Manual (1995) defines a site as the location of a prehistoric or historic occupation or activity. Areas with five or more items were recorded as sites, and areas with four or fewer items were recorded as Isolated Occurrences (IOs). Features were recorded as sites. Resources separated by more than 50 meters (m) or located on different landforms were recorded as distinct sites or as isolates. The sole exception to this methodology involves historic roads.

Cultural resources, including previously identified and new sites and isolated finds, were recorded on appropriate Department of Parks and Recreation (DPR) forms, mapped using a Trimble Geo XT GPS unit, and photographed. Information on the appearance and physical characteristics of the resources and their location was gathered. The survey was non-collection; all artifacts were mapped and photographed in place. No artifacts were collected by CH2M HILL.

Results

Literature Review

The literature searches conducted at the SSJVIC revealed that several previous studies had been conducted within the project area. All previous surveys were thoroughly reviewed. Table 1 lists all previous studies conducted within 1 mile of the project and within 0.5 mile of the proposed transmission line route alternatives.

TABLE 1
Cultural Resources Reports within 1 Mile of the Alta East Wind Project

Report Authors and Date	CHRIS Catalogue NADB Numbers
Adams et al. (1984)	KE-2 ^a
Fleagle (1996)	KE-45
Have Mule Will Travel (1983)	KE-270 ^b
Caruso (1982) ^a	KE-313 ^a
Jackson (1992)	KE-527 ^a
Macko et al. (1993)	KE-633 ^b
Macko and Weisbord (1985)	KE-634 ^{ba}
McGuire (1990)	KE-641 ^b
McManus and McGuire (1985)	KE-651 ^a
Noble and Tordoff (1988)	KE-715 ^a
Sutton (1989)	KE-808
Parr (1991)	KE-837 ^b
Peak (1974)	KE-873 ^a
Salpas (1984)	KE-1029
Salpas (1984)	KE-1030
Schiffman (1982)	KE-1087 ^b
Schiffman (1985)	KE-1102 ^b
Schiffman (1985)	KE-1107 ^a
Schiffman (1985)	KE-1113 ^a
Schiffman (1986)	KE-1217
Schiffman (1987)	KE-1278 ^b
Schiffman (1987)	KE-1279 ^b
Schiffman (1987)	KE-1284 ^b
Schiffman (1987)	KE-1337 ^b

TABLE 1
Cultural Resources Reports within 1 Mile of the Alta East Wind Project

Report Authors and Date	CHRIS Catalogue NADB Numbers
Schiffman (1989)	KE-1340 ^b
Schiffman (1990)	KE-1390 ^b
Schiffman (1992)	KE-1430 ^b
Schiffman (1992)	KE-1486 ^b
Tremaine (1993)	KE-1646 ^a
Schiffman (1982)	KE-1649
Uli and Schiffman (1983)	KE-1662 ^b
Uli and Schiffman (1984)	KE-1679 ^b
Uli and Schiffman (1984)	KE-1693
Uli and Schiffman (1984)	KE-1709 ^a
Uli and Schiffman (1985)	KE-1714 ^a
Uli and Schiffman (1983)	KE-1727 ^b
Young (1978)	KE-1829 ^a
Rubelman (1984)	KE-1859
Laylander (1998)	KE-2192 ^a
BLM (1998)	KE-2197 ^a
BLM (1998)	KE-2205 ^a
Laylander (1998)	KE-2224
LSA Associates, Inc. (1999)	KE-2294
Laylander (1999)	KE-2298
Schiffman (2001)	KE-2565
Dodd (2001)	KE-2585
Schmidt (2002)	KE-2617
Billat (no date)	KE-2651
Nilsson et al. (2007)	KE-3534 ^a
Switalski (2006)	KE-3571 ^a

^aIncluded portions of the Alta East Wind Project area.

^bIncluded portions of the Transmission Route Alternatives

Source: CHRIS Southern San Joaquin Valley Information Center.

Eleven resources, listed on Table 2, were found in the survey area during the literature search. Only four of these resources have been previously evaluated for listing on either the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), and the remaining sites have not been evaluated. Additional information about each resource is provided in the table. A total of 34 additional resources

were found outside the survey area but within a 1-mile buffer of the overall project, or within 0.5 mile of the transmission line alternatives.

TABLE 2
Previously Recorded Cultural Resources in the Survey Area

Site Number	Site Type	NRHP/CRHR Status	Date Listed/Evaluated
15-321	Prehistoric habitation site	Not evaluated	—
15-1515	Prehistoric milling station	Not evaluated	—
15-1703	Milling station w/ artifacts	Not evaluated	—
15-1905	Prehistoric	Not evaluated	—
15-3534	Historic road grade	Not evaluated	—
15-3549	Los Angeles Aqueduct	Not evaluated	—
15-12717	Historic debris scatter	Not evaluated	—
15-13904	Historic railroad spur	Not eligible	6/9/2009
15-13913	Historic can scatter	Not eligible	6/7/2009
15-13915	Historic debris scatter	Not eligible	6/6/2009
15-13924	Historic can scatter	Not eligible	6/8/2009

Source: CHRIS Southern San Joaquin Valley Information Center.

Site 15-321

This site was originally recorded in 1974 as a light flake scatter and lithic reduction site. This site boundary, as originally recorded, was located completely outside of the project archaeological survey area. The site was updated in 1984 as a habitation site with two distinct loci. Groundstone, fire-affected rock, and two chert flakes were noted at Locus A. Locus B contained four to five clusters of fire-affected rock. A new site boundary was drawn and this boundary extended partially into the project survey area. At that time, the site had been disturbed by extensive rodent burrows, grazing sheep, modern roads, motorcycles, and a ditch. This site has not been previously evaluated.

Site 15-1703

This site was originally recorded in 1984 as three shallow bedrock mortars on a single rock outcrop. The mortars were noted as shallow and partially exfoliated. A graded berm was noted adjacent to the site. No artifacts were recorded at this site. This site has not been previously evaluated.

Site 15-1905

This site was originally recorded in 1984 as a scatter of groundstone, flaked stone, and heat-affected rocks. The site boundary, as originally recorded, was located near the western edge of the project survey area in an area of undulating ridges cut by deep drainages. At that time, the site had been disturbed by a modern road cut and a separate bike trail. This site has not been previously evaluated.

Site 15-12717

This site was originally recorded in 2002 as a scatter of glass bottle fragments and over 100 soldered cans. [REDACTED]

[REDACTED] At that time, the site had been disturbed by heavy equipment and construction of the Second Los Angeles Aqueduct and by modern maintenance activities. This site has not been previously evaluated.

Pedestrian Survey

A systematic pedestrian cultural resource survey was conducted from March 1 to March 17, 2011. CH2M HILL archaeologists Gloriella Cardenas, Dan Ewers, Humphrey Calicher, Ryan Rolston, and Eric Peters conducted the survey. Additional site recordation and reconnaissance was conducted by Aaron Fergusson July 5-8, 2011.

Fourteen new cultural sites were found during the survey and subsequently recorded. All sites were recorded on a DPR 532 Primary and a DPR Location form. Additional forms, including DPR Archaeological Site Record forms, Artifact Records, Photograph Records, and Sketch Maps, were completed as necessary. A total of 25 new isolated artifacts (IF) were found during the survey of this 3225.5-acre area. Appendix A, Table 1 contains a complete list of isolated finds. Each isolated find was recorded on a DPR Primary form. Appendix C contains all DPR forms. All site forms will be submitted to the SSJVIC.

The survey area topography varied from relatively level to steep ridges. These areas were completely surveyed with transects spaced 15 m apart. Ground visibility was excellent with approximately 80 to 90 percent visibility. Disturbances to the survey area consist of significant off-highway vehicle (OHV) trails and use, episodes of modern dumping, several dirt roads, underground gas lines, and transmission lines. Observed modern trash includes dump areas with building materials, modern beer cans and bottles, and several smaller dump areas with broken glass, metal, and sanitary cans. Additionally, modern, stone fire hearths were commonly found throughout the project area, specifically near OHV trails. Small washes are present at the lower elevations of the survey area. Sediment was generally alluvial deposition of sand and decomposing granitic material in the areas at lower elevations. Deposition on slopes and ridgelines appears to be the result of a deflating environment, and any observed sediment in these areas was decomposing granitic material.

Archaeological resources observed during the pedestrian study are described for each site and isolated finds.

Temporary Site S-16

This is a historic debris scatter contained within a 10 x 10 m area. Artifacts observed include five glass bottle bases, a meat tin with soldered seams, three drinking glass bases with the diamond S maker's mark, one drinking glass base with a S/Star maker's mark, aqua and purple glass fragments. Vegetation in the immediate area includes creosote and bursage.

Temporary Site S-17

The site is a historic debris scatter located on a broad, gentle slope. The site consists of a surface scatter of artifacts that includes one bold blown medicine bottle neck, one faceted

liquor bottle, one metal bed frame, one aqua mason jar with milk glass lid liner, one rectangular bottle base, one fragment of white stoneware, amethyst glass shards, one metal thermometer, one external-friction rectangular spice can lid and canister, eight hole-in-top matchstick filler milk cans, and a 4-cylinder engine head. Vegetation is primarily bursage with some small bunchgrasses.

Temporary Site S-18

This site consists of a single bedrock mortar. [REDACTED]

[REDACTED] The mortar is conical measuring 13 centimeters (cm) in diameter and 5.5 cm in depth. The only sediment found in the bottom of the mortar is likely windblown sediments and not due to residual processing deposits. The surrounding area is a juniper woodland environment.

Temporary Site S-19

This site consists of a single bedrock mortar. [REDACTED]

[REDACTED] The mortar is conical, measuring 17 cm x 15 cm and 6.5 cm in depth. The boulder is 70 cm x 85 cm, and 28 cm high. The mortar contained very little sediment, which likely blew into the mortar. The surrounding area is a juniper woodland environment.

Temporary Site S-20

The site is a historic debris scatter located on a broad slope with intermittent drainages. The site consists of a surface scatter of artifacts, including 20 matchstick filler cans measuring 3 14/16 inch x 2 15/16 inch, 8 Sanitary type cans, a brown glass bottle base, and a single obsidian flake.

Temporary Site S-21

The site is a rock cairn of unknown age and purpose. The cairn comprising 11 cobbles measuring 54 cm x 52 cm and 27 cm high. [REDACTED]

[REDACTED] No associated artifacts were found to help date the feature.

Temporary Site S-22

The site is a rock cairn of unknown age and purpose. The cairn measures 65 cm x 93 cm and is 9 cm high. [REDACTED]

[REDACTED] No associated artifacts were found to help date the feature.

Temporary Site S-23

The site is a rock cairn of unknown age and purpose, although it is likely historic because a milled wood post fragment is present. The cairn measures 82 cm x 160 cm and is 28 cm high. [REDACTED]

[REDACTED] No other associated artifacts were found to help date the feature.

Temporary Site S-24

This site is a historic refuse scatter [REDACTED]

[REDACTED] (CA-Ker-3534H). The site contains a number of types of debris, including cans, glass bottle fragments, and pushed-up asphalt. The site covers an area measuring 75 m x 35 m.

Temporary Site S-25

This site is a historic refuse scatter [REDACTED] The site contains a number of types of debris including cans, glass bottle fragments, and miscellaneous metal fragments. The site covers an area measuring 85 m x 40 m.

Temporary Site S-26

This site consists of a scatter of fire-affected rock [REDACTED] The rock is found in an area covering 3.4 m x 5.8 m with more than 74 fragments of fire-affected rock. One of the fragments appeared to be a groundstone fragment of a mano.

Temporary Site S-27

This site consists of a scatter of fire-affected rock [REDACTED] The rock is found in an area covering 4.4 m x 3.5 m with more than 43 fragments of fire-affected rock. It is located 5 m from an OHV trail, and a possible motorcycle trail cuts through the feature.

Temporary Site S-28

This site consists of a scatter of fire-affected rock [REDACTED] The rock is found in an area covering 5.3 m x 4.2 m with more than 39 fragments of fire-affected rock. The area is crossed with OHV trails.

Temporary Site S-29

This site consists of a circular depression with over 100 fragments of fire-affected rock, 2 bifacially flaked tools, at least 5 flakes, 1 core, 1 mano fragment, and 1 possible slab metate in an area measuring 120 m x 125 m. Significant modern disturbances on the site include [REDACTED] a modern burned trash pile, and three modern fire hearths. The depression measures 6 m in diameter and is approximately 40 cm deep. [REDACTED]

Isolated Finds

The survey documented 25 new isolates. These isolated finds are listed in detail in Appendix A, Table 1. Isolates, by definition, lack immediate cultural context and therefore lack the data potential that would be required to be considered eligible for the NRHP or CRHR. None of the isolated finds represents unique archaeological resources, and none is considered significant resources for the purpose of California Environmental Quality Act (CEQA) compliance.

Determination of Eligibility and Assessment of Potential Effects

Standards of Significance

Standards of significance for the proposed project were determined from adopted standards from the following sources:

- National Register Bulletin (1995)
- CEQA Guidelines Appendix G (2002)
- Kern County General Plan (March 2007)
- Kern County Environmental Checklist Form (May 2005)

Adopted standards of significance applicable to cultural resources are provided in the CEQA Guidelines Appendix G (2002). Significance criteria considered for the cultural resources impact analysis are provided below.

Adverse effects on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of federal agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

The protection of cultural resources is governed by several federal laws and regulations, including the NHPA (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990).

Applicable Standards

Under Section 110 of the NHPA, federal agencies are required to locate and inventory all resources under their purview that are recommended as eligible for inclusion in the NRHP on owned, leased, or managed property. In accordance with EO 12372, *Intergovernmental Review of Federal Programs*, determinations regarding the potential effects of an undertaking on historic properties are presented to the State Historic Preservation Office, federally recognized Native American tribes, and other interested parties. A resource shall be considered historically significant if it meets the criteria for listing on the NRHP, including the following:

- It is associated with events that have made a significant contribution to the broad patterns of history (Criterion A).
- It is associated with the lives of persons significant to our past (Criterion B).

- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C).
- Has yielded, or has the potential to yield, information important to the prehistory or history (Criterion D).

In addition to the above criteria, a resource must retain integrity to be considered historically significant. Integrity is the authenticity of the physical identity that is evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Rehabilitation or restoration does not necessarily discount a resource from eligibility. Integrity must also be evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource that has lost its historic character or appearance and is not eligible for the NRHP may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

An adverse effect on a cultural resource is defined by CEQA as follows:

- Substantial adverse change in the significance of a historical resource by physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings
- Demolishes or materially alters those physical characteristics of a historical resource that convey its significance and that justify its inclusion in, or eligibility for inclusion in, the NRHP, CRHR, or inclusion in a local register

Section 7052 of the California Health and Safety Code establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives. Penal Code Section 622.5 provides misdemeanor penalties for injuring or destroying objects of historical or archaeological interest located on public or private lands, but specifically excludes the landowner. Public Resources Code Section 5097.5 defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historical, or paleontological resources located on public lands.

National Register of Historic Places

The preservation of historic properties became national policy with the passage of the Antiquities Act of 1906, the Historic Sites Act of 1935, and the NHPA of 1966. The NRHP is used as a guide by federal, state, and local agencies, private groups, and citizens to identify historical resources and to include which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The NRHP may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources
- Resources that contribute to a historic district

- Resources identified as significant in historic resource surveys
- Resources with a significance rating of Category 1 through Category 4 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP)

California Register of Historical Resources

As provided in California Public Resources Code Section 5020.4, the California Legislature established the CRHR in 1992. The CRHR is used as a guide by state and local agencies, private groups, and citizens to identify the state historical resources and to include which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR, as instituted by the California Public Resources Code, automatically includes all California properties already listed in the NRHP. It also includes those formally determined to be eligible for listing in the NRHP (Categories 1 and 2 in the State Inventory of Historical Resources), specific listings of the State Historical Landmarks and in the State Inventory of Historical Resources), and specific listings of State Historical Landmarks and State Points of Historical Interest. The CRHR may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources
- Resources that contribute to a historic district
- Resources identified as significant in historic resource surveys
- Resources with a significance rating of Category 3 through Category 5 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP; Category 5 indicates a property with local significance)

The CRHR is consistent with the NRHP by using the 50-year threshold. A resource is usually considered for its historical significance after it reaches the age of 50 years. This threshold is not absolute, but was selected as a reasonable span of time after which a professional evaluation of historical value/importance can be made.

Kern County General Plan

The general plan for Kern County contains guidelines for the preservation of cultural and historic resources in the county that provide ties to the past and are considered to possess value to residents and visitors. The following measures are to be implemented when projects may impact cultural or historic resources:

Coordinate with the California State University, Bakersfield, Archaeology Inventory Center.

The County shall address archaeological and historical resources for discretionary projects in accordance with CEQA.

The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through established procedures for discretionary projects and CEQA documents.

On a project specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

Kern County CEQA Implementation Document and Environmental Checklist

Kern County maintains a threshold of significance related to cultural resources. The Implementation Document and the Environmental Checklist state that a project could have a significant impact on cultural resources if the project could:

- Cause a substantial adverse change in the in the significance of a historical resource as defined in Public Resources Code section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5;
- Disturb any human remains, including those interred outside of formal cemeteries.

California Register/National Register Status

A total of 14 new sites and 2 previously recorded sites were evaluated for inclusion in the NRHP/CRHR for the 2011 cultural resources surveys. Fifteen of these resources recorded during the project survey have been recommended by CH2M HILL as not eligible for inclusion in the NRHP/CRHR. One site, S-29, is potentially eligible. S-29 will be avoided through project design, and to avoid further potential effects to the site, no additional testing will be conducted to determine the eligibility. Table 3 shows each site’s disposition and the CH2M HILL recommendations. A discussion of the eligibility of each site follows Table 3.

TABLE 3
Sites Evaluated during the Alta East Wind Project Archaeological Survey

Site Number	Site Description	NRHP/CRHR
15-1905	Not relocated within the survey area	Unevaluated
15-12717	Six artifacts were located within the survey area; the rest of the site is outside the APE	Not eligible
S-16	Historic debris scatter	Not eligible
S-17	Historic debris scatter	Not eligible
S-18	Prehistoric milling feature	Not eligible
S-19	Prehistoric milling feature	Not eligible
S-20	Historic debris scatter	Not eligible
S-21	Rock cairn	Not eligible
S-22	Rock cairn	Not eligible
S-23	Rock cairn	Not eligible
S-24	Historic debris scatter	Not eligible
S-25	Historic debris scatter	Not eligible

TABLE 3
Sites Evaluated during the Alta East Wind Project Archaeological Survey

Site Number	Site Description	NRHP/CRHR
S-26	Fire-affected rock scatter	Not eligible
S-27	Fire-affected rock scatter	Not eligible
S-28	Fire-affected rock scatter	Not eligible
S-29	Prehistoric habitation site	Potentially eligible

Site 15-1905

This site could not be located within the project survey area and therefore cannot be evaluated for eligibility for listing on the NRHP or the CRHR. No further work is recommended.

Site 15-12717

This historic site is a can-and-glass scatter [REDACTED]. Artifacts include bottle glass fragments (lips, necks, and bases) and over 100 soldered cans. The site appears to be associated with the construction of the First Los Angeles Aqueduct, thereby dating to 1908 or 1913. Although this historic refuse scatter is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-16

This is a historic debris scatter of primarily glass bottle fragments, including some bases with maker's marks. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. This historic debris scatter is in fair condition. However, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-17

The site is a historic debris scatter consisting of a surface scatter of artifacts, primarily domestic-type items. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. This historic debris scatter is in fair condition, appearing to be a single episode dump or refuse. While these domestic artifacts may relate to early twentieth century settlement of the area, the absence of features or a household means the site does not possess any particular archaeological potential to yield significant information on local history. The site is recommended as not eligible for listing on the NRHP or the

CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-18

This site consists of a single, conical bedrock mortar found on an igneous boulder surface [REDACTED] This isolated prehistoric feature lacks any direct association with any other prehistoric site or artifact. Dating the feature would be difficult to impossible, and there are no intact deposits left within the mortar for analysis. The depositional environment located around the boulder is not one that would allow for the preservation of intact cultural materials providing any additional data about this feature. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-19

This site consists of a single, conical bedrock mortar located on a heavily exfoliated boulder surface. This isolated prehistoric feature lacks any direct association with any other prehistoric site or artifact. Dating the feature would be difficult to impossible, and no intact deposits are left within the mortar for analysis. The depositional environment located around the boulder is not one that would allow for the preservation of intact cultural materials providing any additional data about this feature. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-20

The site is a historic debris scatter consisting of a surface scatter of artifacts, mainly cans, with a single obsidian flake. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. This historic debris scatter is in fair condition. The obsidian flake is not likely associated with the historic artifacts, but is out of context with any prehistoric occupation or use. However, there are no definitive artifacts related to any of the historic events listed above, and the prehistoric flake lacks any context for analysis. The site does not possess any particular archaeological potential to yield significant information on local history or prehistory. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-21

The site is a rock cairn of unknown age and purpose, but is likely historic. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. Any one of these activities are commonly associated with the building of temporary cairns, either for marking mining claims or for marking paths or properties. However, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not appear to qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-22

The site is a rock cairn of unknown age and purpose, but is likely historic. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. Any one of these activities are commonly associated with the building of temporary cairns, either for marking mining claims or for marking paths or properties. However, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-23

The site is a rock cairn of unknown age and purpose, although is likely historic because of the presence of a milled wood post fragment. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. Any one of these activities are commonly associated with the building of temporary cairns, either for marking mining claims or for marking paths or properties. However, there are no definitive artifacts related to any of the historic events listed above, and the site does not possess any particular archaeological potential to yield significant information on local history. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-24

This site is a historic refuse scatter [REDACTED] (CA-Ker-3534H). Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. This historic debris scatter is in fair condition. However, there are no definitive artifacts related to any of the historic events listed above. The site does not possess any particular archaeological potential to yield significant information on local history or prehistory. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-25

This site is a historic refuse scatter containing cans, glass bottle fragments, and miscellaneous metal fragments. Historic use of the area includes gold prospecting and mining, hunting, farming, and ranching. This historic debris scatter is in fair condition. However, there are no definitive artifacts related to any of the historic events listed above. The site does not possess any particular archaeological potential to yield significant information on local history or prehistory. The site is recommended as not eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-26

This site is a small, simple scatter of fire-affected rock with one fragment of groundstone. The groundstone fragment is also a fragment of fire-affected rock. The feature is likely the

remnants of a hearth, but there is no remaining form of a hearth because the fire-affected rock is eroding down a slope. No charcoal stains are visible from the surface, and based on the movement of fire-affected rock down the slope, there is very likely no potential for buried cultural remains or charcoal to help date the feature. No artifacts are associated with the feature to help place it in the regional prehistoric chronology. Based on the complete lack of data potential from this site, it is recommended Not Eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-27

This site is a small, simple scatter of fire-affected rock. The feature is likely the remnants of a hearth, but there is no remaining form of a hearth as the fire-affected rock is eroding down a slope. No charcoal stains are visible from the surface, and based on the movement of fire-affected rock down the slope, there is very likely no potential for buried cultural remains or charcoal to date the feature. No artifacts are associated with the feature to help place it in the regional prehistoric chronology. Based on the complete lack of data potential from this site, it is recommended Not Eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-28

This site is a small, simple scatter of fire-affected rock. The feature is likely the remnants of a hearth, but there is no remaining form of a hearth. No charcoal stains are visible from the surface, and based on the active deflation of the area, there is very likely no potential for buried cultural remains or charcoal to help date the feature. No artifacts are associated with the feature to help place it in the regional prehistoric chronology. Based on the complete lack of data potential from this site, it is recommended Not Eligible for listing on the NRHP or the CRHR under any of the criteria and does not qualify as a historic property under Section 106. No further work is recommended.

Temporary Site S-29

This site is a relatively large scatter of fire-affected rock and prehistoric artifacts with a 6-m-diameter circular depression. The site has been cut by at least three different OHV roads, and much of the fire-affected rock is found along the main north-south roadcut. Other modern disturbances include three modern fire hearths and a large burned debris pile. The depression on the site offers the potential for some significant data and buried cultural deposits, if it is associated with the prehistoric component of the site. Due to the depression on the site and the large amount of fire-affected rock apparently eroding from a shallow road cut, this site may have potential for buried cultural material. Further testing and limited data recovery would be required to make a recommendation for eligibility for listing on the NRHP or the CRHR, but testing may further affect the site. This site will be avoided by the project, and no further work is recommended at this time.

Potential for Buried Archaeological Resources

The potential of an area to contain buried resources can often be assessed by an examination of an area's topography, soil types, and proximity to water. Buried sites are found in many

contexts, especially alluvial fans and stream terraces. Buried sites are more likely in certain locations near watercourses where deposition is deep or where previous studies have shown a higher density of sites or where ongoing deposition occurs. All of these conditions were considered while assessing the sensitivity for subsurface archaeological deposits at the project site. The general area consists of several active washes and some alluvial deposition, which are conditions that would typically contribute to a moderate sensitivity for the presence of buried, intact cultural resources. No water was observed in the study area, but several small creeks are extant in the area and would have provided water to the survey area.

However, the project area has a relatively low site density. A review of the paleontological maps (contained within the draft paleontological survey report currently under internal review) illustrating the geology of the area shows limited areas of alluvial deposition attributed to the late Pleistocene and Holocene. These areas are limited to the active wash areas and vicinity. Quaternary alluvium within the project area was described as a gray to tan, unconsolidated arkosic sand. To assess subsurface conditions, all accessible cutbanks and soil profile exposures were observed during the archaeological survey. Particular attention was paid to exposures in the lower and relatively level areas of the project area. Several of these exposures were found within the many seasonal washes and drainages found throughout the project area. The exposures usually ranged in depth from approximately 2 to 5 feet. Deposition observed throughout was fairly uniform, and no changes in sediment types or colors were observed between the surface and the deposition below. Nothing cultural was observed in any of the cutbanks or other soil profiles observed, including areas examined within and outside of archaeological site boundaries.

Recent Archaeological Excavation Data

To the extent it may be applicable and of utility in defining the potential for significant subsurface cultural resources deposits to be present at the project site, the results of recent test excavations conducted at 11 archaeological sites near the project site indicated no cultural depth or subsurface features (Fergusson et al. 2010; Lawson et al. 2009). Subsurface testing was conducted within similar landforms present at the project site, including small level valleys with alluvial deposition, large open alluvial flats, and gently sloping saddles or level bluff areas with deflating or colluvial deposition. Much of the subsurface alluvial soils observed exhibited evidence of bioturbation, erosion, frost heave, and compaction. The conclusions drawn from this limited testing appeared to indicate little potential for significant historical resources to be present within these contexts and among these site types in the general project vicinity.

Management Considerations

CH2M HILL concludes that the Alta East Wind Project as described and reported in this document would not have the potential to adversely impact historical resources on the condition that Site S-29 will be avoided. If Site S-29 cannot be avoided, further testing and limited data recovery should be conducted to assess this site's potential for listing on the NRHP or CRHR. The remaining cultural resources documented for this study are considered not eligible for listing on the CRHR or the NRHP.

There is a low possibility for buried cultural resources to be present in the project area because of the alluvial, colluvial, and Aeolian processes at work in the project area. In general, the topography and the soil types of the project area create an environment where archaeological resources could be buried without any surface manifestation. The cultural resource survey for this project indicated high-density areas of cultural resource materials where buried components, if found, could provide information to add to the eligibility of a resource. As with any ground-disturbing project, there remains a potential for the accidental discovery of buried cultural resources not detected through a surface inventory, or even through shovel testing. If cultural resources or materials are discovered during ground-disturbing activities, the work near the discovery should cease, and the area should be protected until the find can be evaluated by a qualified archaeologist. Depending on the nature of the find, additional consultation with the State Historic Preservation Office or tribal leaders may be necessary before work can resume in the area of the find.

If human remains are discovered, the BLM Ridgecrest Field Office Archaeologist and the Kern County Coroner must be notified within 48 hours, and there should be no further disturbance to the site where the remains were found until the process as described in Public Code Section 5097.98 has been completed.

References Cited

Fergusson, Aaron, Natalie Lawson, and Clint Helton. 2010. Cultural Testing Report for the Alta Oak Creek Mojave Wind Project, Kern County, California.

Lawson, Natalie, Gloriella Cardenas, and Clint Helton. 2010. Cultural Resource Inventory Report for the Alta East Wind Energy Project, Kern County, California. On file with CH2M HILL. Santa Ana, California.

Lawson, Natalie, Aaron Fergusson, Clint Helton, and Jessica Feldman. 2009. Cultural Resources Inventory Report for the Alta Oak Creek Mojave Wind Project, Kern County, California.

Temporary Site Number	Site Period	Site Type	Site Description	NRHP/CRHR Eligible?
15-1905	Prehistoric	Prehistoric habitation	Lithic and groundstone scatter with BRMs	Unevaluated
15-12717	Historic	Debris Scatter	Scatter of historic glass and cans	No
S-16	Historic	Debris Scatter	Scatter of historic bottle glass	No
S-17	Historic	Debris Scatter	Scatter of historic bottle glass and cans	No
S-18	Prehistoric	Bedrock Mortars	Single BRM	No
S-19	Prehistoric	Bedrock Mortars	Single BRM	No
S-20	Historic	Debris Scatter	Historic debris scatter and a single obsidian flake	No
S-21	Historic	Cairn	Historic Cairn	No
S-22	Unknown	Cairn	Historic Cairn	No
S-23	Unknown	Cairn	Historic Cairn	No
S-24	Historic	Debris Scatter	Historic debris scatter near historic road	No
S-25	Historic	Debris Scatter	Historic debris scatter	No
S-26	Prehistoric	Fire-affected rock	Small scatter of fire-affected rock	No
S-27	Prehistoric	Fire-affected rock	Small scatter of fire-affected rock	No
S-28	Prehistoric	Fire-affected rock	Small scatter of fire-affected rock	No
S-29	Prehistoric	Habitation site	Fire-affected rock and lithic scatter with a circular depression	Potentially
I-46	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-47	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-48	Historic	Isolated Find	SCA glass fragment	No
I-49	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-50	Historic	Isolated Find	Two hole-in-top, matchstick filler cans	No
I-51	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-52	Historic	Isolated Find	Two hole-in-top, matchstick filler cans	No
I-53	Historic	Isolated Find	Hinged lid tobacco tin	No
I-54	Historic	Isolated Find	Hinged lid tobacco tin	No
I-55	Historic	Isolated Find	4 hole-in-top, matchstick filler cans	No
I-56	Prehistoric	Isolated Find	3 prehistoric flakes	No
I-57	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-58	Prehistoric	Isolated Find	Single obsidian flake	No
I-59	Prehistoric	Isolated Find	Single rhyolite flake	No
I-60	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No

Temporary Site Number	Site Period	Site Type	Site Description	NRHP/CRHR Eligible?
I-61	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-62	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-63	Historic	Isolated Find	Historic glass base fragment	No
I-64	Historic	Isolated Find	Blue glass bottle fragment	No
I-65	Historic	Isolated Find	Glass base fragment	No
I-66	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-67	Historic	Isolated Find	Clear glass bottle base	No
I-68	Historic	Isolated Find	Hinged lid tobacco tin	No
I-69	Historic	Isolated Find	Single hole-in-top, matchstick filler can	No
I-70	Prehistoric	Isolated Find	White chert, utilized flake	No

Appendix B

Survey Maps

Confidential information has been removed.

Appendix B
Survey Maps

Appendix C

DPR Site Forms

Confidential information has been removed.

